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U. S. DEPARTMENT OF THE INTERIOR

PROTOTYPE OIL SHALE LEASING PROGRAM

TRACT C-b

QUARTERLY REPORT #3

(Through May 31, 1975)

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Submitted to:

Mr. Peter A. Rutledge
Area Oil Shale Supervisor
Conservation District
U. S. Geological Survey
Grand Junction, Colorado

By:

Ashland Oil, Inc.
Atlantic Richfield Company
Shell Oil Company, Operator
The Oil Shale Corporation

JULY 15, 1975

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U. S. DEPARTMENT OF THE INTERIOR

PROTOTYPE OIL SHALE LEASING PROGRAM

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PRE-EXPLORATION ENVIRONMENTAL RECONNAISSANCE SURVEYS

I. PRE-EXPLORATION ENVIRONMENTAL RECONNAISSANCE SURVEYS

No field activities were undertaken this quarter which were not already cleared with a pre-exploration environmental reconnaissance survey. Only one additional survey report is expected for the sites currently scheduled for disturbance. However, it is anticipated that as our continually evolving program causes a site to be relocated or an additional site to be added, then more of these surveys will be required.

ENVIRONMENTAL BASELINE MONITORING PROGRAMS

II B CORE DRILLING AND ASSOCIATED GROUND WATER

The following Well Summary Table, Table II B-1, has been updated from that which appeared in Quarterly Report #2. A few clerical tabulation errors in the previous table have been corrected here. Figure II B-1 shows the well locations and is included for reference.

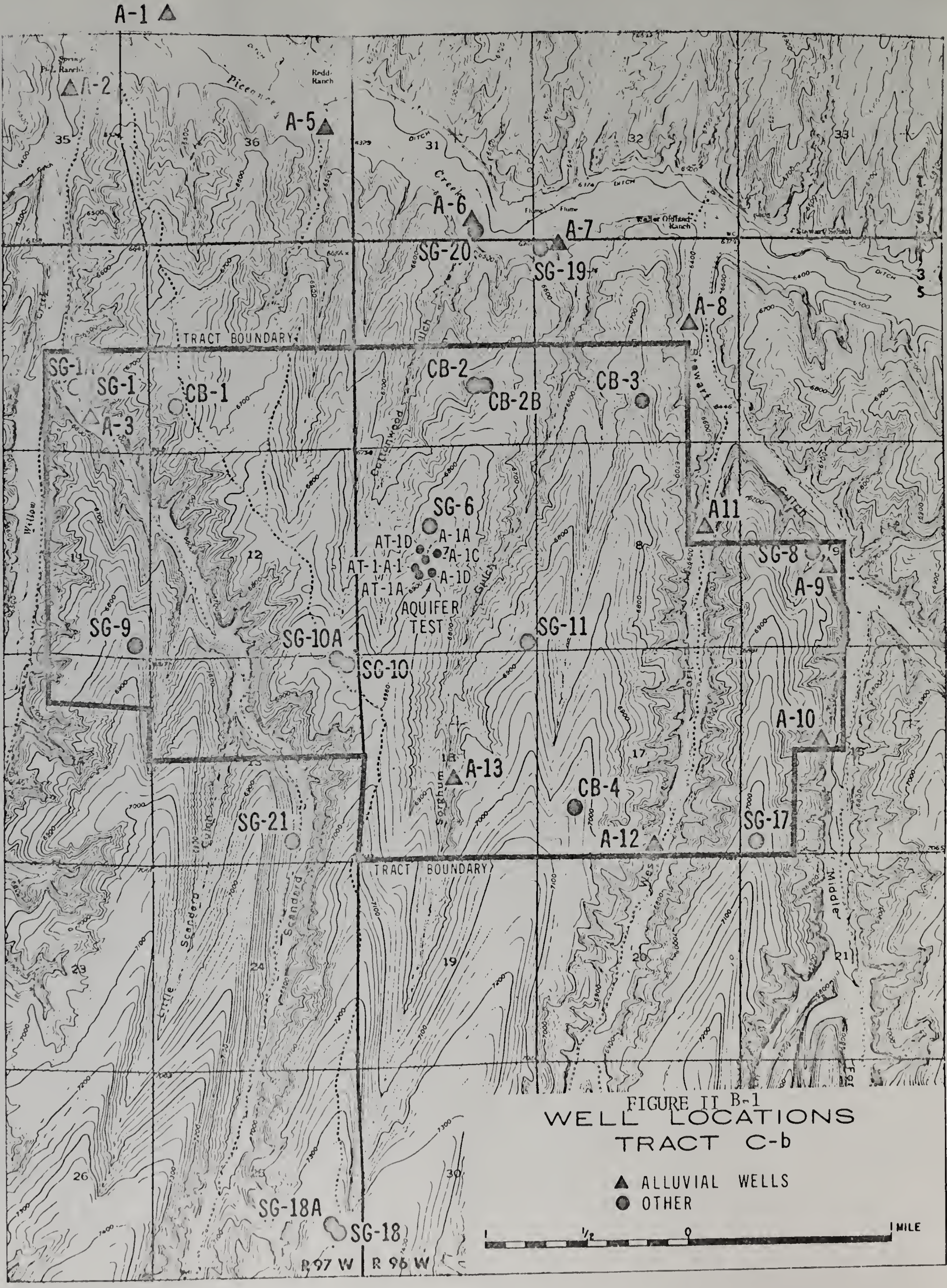

FIGURE II B-1
WELL LOCATIONS
TRACT C-b

▲ ALLUVIAL WELLS
● OTHER
1 1/2 0 1 MILE
A-1
A-2
A-3
A-5
A-6
A-7
A-8
A-9
A-10
A11
A-12
A-13
SG-1A
SG-1
SG-6
SG-8
SG-9
SG-10A
SG-10
SG-11
SG-17
SG-18A
SG-18
SG-19
SG-20
SG-21
CB-1
CB-2
CB-2B
CB-3
CB-4
AT-1D
AT-1-A-1
AT-1A
A-1A
A-1C
A-1D
AQUIFER TEST
TRACT BOUNDARY
TRACT BOUNDARY
Piceance Creek
Cottonwood Gulch
Stewart Gulch
Sorghum Gulch
Willow Creek
Scandard
Little Scandard
Middle
Redd Ranch
Keller Old Ranch
DITCH
Flume
R 97 W
R 96 W
35
36
31
32
33
11
12
7
8
9
13
18
17
16
23
24
19
20
21
26
25
30

TABLE II B-1
WELL SUMMARY TABLE

1. Well Designation	AT-1	AT-1a	AT-1a	AT-1b	AT-1c	AT-1d	SG-1	SG1a	SG-6	SG-8	SG-9	SG-10	SG-10a	SG-11
2. Well Type	AT	AT (CH)	AT	AT	AT	AT	CH	GHT	CH (AT)	CH	CH	CH (AT)	GHT	CH (AT)
3. Completion Date	1/23/ 75	7/17/ 74	7/10/ 74	7/20/ 74	8/18/ 74	7/28/ 74	12/6/ 74	2/7/ 75	8/22/ 74	11/27/ 74	10/23/ 74	6/29/ 74	7/10/ 74	9/8/ 74
4. Total Depth (Geolograph)	1700	1621	1341	1638	1640	1640	2525	1180	2220	2608	2750	2211	1333	2826
5. Water Data														
a. Drilling Water Production	C1Q 2Q	C1Q	C1Q	C1Q	C1Q	C1Q	C2Q	C2Q	C1Q	C1Q	C1Q	C1Q	c1Q	C1Q
b. Drilling Water Samples	1	4	NA	NA	4	NA	7	NA	5		5	4	NA	25
c. Water Quality Analyses	C1Q 2Q	C1Q			C1Q		C2Q		C1Q		C1Q	C1Q		C1Q
6. Aquifer Data														
a. Drill Stem Tests		C1Q			C1Q		C3Q			C3Q		C1Q		
b. Jetting Tests	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C2Q	C3Q	C1Q		C1Q	C1Q	C1Q	C1Q
7. Geophysical Logs,														
a. Schlumberger (1) Borehole, Compensated Sonic	C1Q	*		C1Q	C3Q	C1Q	C2Q		C3Q	C2Q	C2Q	*		C1Q
(2) Laterolog	C1Q	*		C1Q	C3Q	C1Q	C2Q		C3Q	C2Q	C2Q	*		C1Q
(3) Formation Density	C1Q	*		C1Q		C1Q	C2Q	C2Q		C2Q	C2Q	*		
(4) Compensated Neutron Formation Density		*		C1Q	C3Q	C1Q			C3Q			*		
(5) Temperature	C1Q	C1Q		C1Q	C3Q	C1Q	C2Q		C3Q	C2Q	C2Q	C1Q		C1Q
(6) Cement Bond Log		*		C3Q	C3Q	C3Q	C3Q		C3Q		C3Q	*		C3Q
(7) Perforated Depth Control							C3Q				C3Q			
(8) Casing Collar Log and Perforating Record														
(9) Oriented Perforating Record and Casing Collar Log				C3Q	C3Q	C3Q	C3Q		C3Q		C3Q			C3Q
b. Geophysical Logs, Other														
(1) Welex, Micro-seismogram		C1Q										C1Q		
(2) McCullough, Temperature				C1Q										
8. Field Lithologic Log	C1Q	C3Q	C1Q	C1Q	C1Q	C1Q	C3Q	C2Q	C3Q	C3Q	C3Q	C3Q	C1Q	C3Q
9. Cored Interval														
a. Top	NA	1270	NA	NA	NA	NA	550	NA	1195	580	1200	1200	NA	750
b. Bottom	NA	1519	NA	NA	NA	NA	2525	NA	2220	2608	2750	2211	NA	2810
10. Assay Data														
a. Fischer Assay	NA	C1Q	NA	NA	NA	NA	C3Q	NA	C3Q	C3Q	C2Q	C1Q	NA	C3Q
b. Soluble Sodium	NA	C1Q	NA	NA	NA	NA	C3Q	NA	C3Q	C3Q	C2Q	C1Q	NA	C3Q
c. Alumina	NA	C1Q	NA	NA	NA	NA	C3Q	NA	C3Q	C3Q	C2Q	C1Q	NA	C3Q
11. Trace Element Analysis			C2Q 3Q							C2Q 3Q	C2Q 3Q	C2Q 3Q		
12. Rock Mechanics Data		C1Q										C1Q		
13. Gas Data														
a. Drilling Log	NA	NA	NA	NA		NA	C1Q		C1Q	C1Q	C1Q		NA	C1Q
b. Bomb Samples	NA	NA	NA	NA	2	NA	8		4	11	8		NA	6
c. Bomb Analyses	NA	NA	NA	NA	C2Q	NA	C1Q 2Q		C1Q	C1Q 2Q	C1Q			C1Q
14. Completion Data	C2Q	C1Q	C1Q	C1Q	C1Q	C1Q	C2Q	C2Q	C1Q	C2Q	C1Q	C1Q	C1Q	C1Q
15. Survey Plat	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C3Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q

KEY:
NA = Not Applicable
Inc. = Incomplete
C1Q = Complete, First Quarterly Report
C2Q = Complete, Second Quarterly Report
C3Q = Complete, Third Quarterly Report

*Birdwell Company logs run on this well instead of Schlumberger. See Quarterly Report #1.

**Alluvial Pump Test.

Not applicable. Wells drilled prior to granting C-b Tract Lease.

TABLE II B-1 (continued)
WELL SUMMARY TABLE

1. Well Designation	SG-17	SG-18	SG-18a	SG-19	SG-20	SG-21	Cb-1	Cb-2	Cb-2b	Cb-3	Cb-4	NQ7	NQ12	
2. Well Type	CH	AB (GHT)	GHT	GHT	GHT	GHT	GHT	GHT	AB (GHT)	GHT	GHT	CH	CH	
3. Completion Date	1/13/75	10/13/74	10/18/74	9/28 74	12/13/74	1/8/75	OLD	OLD	9/20/74	OLD	OLD			
4. Total Depth (Geolograph)	2460	1430	1330	980	987	1036	2104	1482	1220	2122	1470			
5. Water Data							#	#		#	#			
a. Drilling Water Production	C2Q	C1Q	C1Q	C1Q	C2Q	C2Q			C1Q					
b. Drilling Water Samples	31	3	1	4	5	5	-	-		-				
c. Water Quality Analyses	C2Q 3Q	C1Q	C1Q	C1Q	C2Q	C2Q								
6. Aquifer Data														
a. Drill Stem Tests	C2Q 3Q	-	-	-	C2Q 3Q	C2Q 3Q								
b. Jetting Tests	C2Q 3Q	C1Q	C1Q	C1Q	C2Q	C2Q								
7. Geophysical Logs,														
a. Schlumberger (1) Borehole, Compensated Sonic	C2Q	C1Q	-	C1Q	C2Q	C2Q								
(2) Laterolog	C2Q	C1Q	-	C1Q		C2Q								
(3) Formation Density	C2Q	C1Q	-	C1Q	C2Q	C2Q								
(4) Compensated Neutron Formation Density														
(5) Temperature	C2Q	C1Q	-	C1Q	C2Q	C2Q	C2Q	C2Q	-	C2Q	C2Q			
(6) Cement Bond Log	C3Q						C3Q	C3Q			C3Q			
(7) Perforated Depth Control	C3Q						C3Q	C3Q						
(8) Casing Collar Log and Perforating Record							C3Q	C3Q			C3Q			
(9) Oriented Perforating Record and Casing Collar Log	C3Q													
b. Geophysical Logs, Other														
(1) Welex, Micro-seismogram														
(2) McCullough, Temperature														
8. Field Lithologic Log	C3Q	C3Q	C1Q	C3Q	C2Q	C2Q	#	#	C1Q	#	#			
9. Cored Interval							#	#		#	#			
a. Top		1380	NA	930	-	-	1		NA					
b. Bottom		1426	NA	980	-	-								
10. Assay Data							#	#	NA	#	#			
a. Fischer Assay	C3Q	C3Q		C1Q	C3Q	C3Q								
b. Soluble Sodium	C3Q	C3Q		C3Q	C3Q	C3Q								
c. Alumina	C3Q	C3Q		C3Q	C3Q	C3Q								
11. Trace Element Analysis							#	#	NA	#	#			
12. Rock Mechanics Data							#	#	NA	#	#			
13. Gas Data							#	#		#	#			
a. Drilling Log	C2Q	C1Q	C1Q	C1Q	C2Q				C1Q					
b. Bomb Samples	31	1	1	4	5	4			1					
c. Bomb Analyses	C1Q 2Q	C1Q	C1Q	C1Q	C2Q	C2Q			C1Q					
14. Completion Data	C2Q	C1Q	C1Q	C1Q	C2Q	C2Q	C1Q	C2Q	C1Q	C1Q	C1Q			
15. Survey Plat	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C3Q	C3Q	

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NA = Not Applicable
Inc. = Incomplete
C1Q = Complete, First Quarterly Report
C2Q = Complete, Second Quarterly Report
C3Q = Complete, Third Quarterly Report

*Birdwell Company logs run on this well instead of Schlumberger. See Quarterly Report #1.
**Alluvial Pump Test.
Not applicable. Wells drilled prior to granting C-b Tract Lease.

TABLE II B-1 (continued)
WELL SUMMARY TABLE

1. Well Designation	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	
2. Well Type	AW	AW	AW	AW	AW	AW	AW	AW	AW	AW	AW	AW	AW	
3. Completion Date														
4. Total Depth (Geolograph)	112	82	109	64	86	60	51	70	57	67	66	81	14	
5. Water Data														
a. Drilling Water Production														
b. Drilling Water Samples														
c. Water Quality Analyses	C1Q	C1Q	C1Q	NA	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	NA	
6. Aquifer Data														
a. Drill Stem Tests														
b. Jetting Tests														
7. Geophysical Logs,	NO LOGS RUN													
a. Schlumberger (1) Borehole, Compensated Sonic														
(2) Laterolog														
(3) Formation Density														
(4) Compensated Neutron Formation Density														
(5) Temperature														
(6) Cement Bond Log														
(7) Perforated Depth Control														
(8) Casing Collar Log and Perforating Record														
(9) Oriented Perforating Record and Casing Collar Log														
b. Geophysical Logs, Other														
(1) Welex, Micro-seismogram														
(2) McCullough, Temperature														
8. Field Lithologic Log	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C2Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	
9. Cored Interval	WELLS NOT CORED													
a. Top														
b. Bottom														
10. Assay Data	NO ASSAYS													
a. Fischer Assay														
b. Soluble Sodium														
c. Alumina														
11. Trace Element Analysis	NO ANALYSIS													
12. Rock Mechanics Data	NO ROCK MECHANICS DATA													
13. Gas Data	NO GAS DATA													
a. Drilling Log														
b. Bomb Samples														
c. Bomb Analyses														
14. Completion Data	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	
15. Survey Plat	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	C1Q	

KEY:
NA = Not Applicable
Inc. = Incomplete
C1Q = Complete, First Quarterly Report
C2Q = Complete, Second Quarterly Report
C3Q = Complete, Third Quarterly Report

*Birdwell Company logs run on this well instead of Schlumberger. See Quarterly Report #1.
**Alluvial Pump Test.
# Not applicable. Wells drilled prior to granting C-b Tract Lease.

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Streams

ENVIRONMENTAL BASELINE MONITORING PROGRAMS

II A. Surface Water
II A-1. Surface Streams

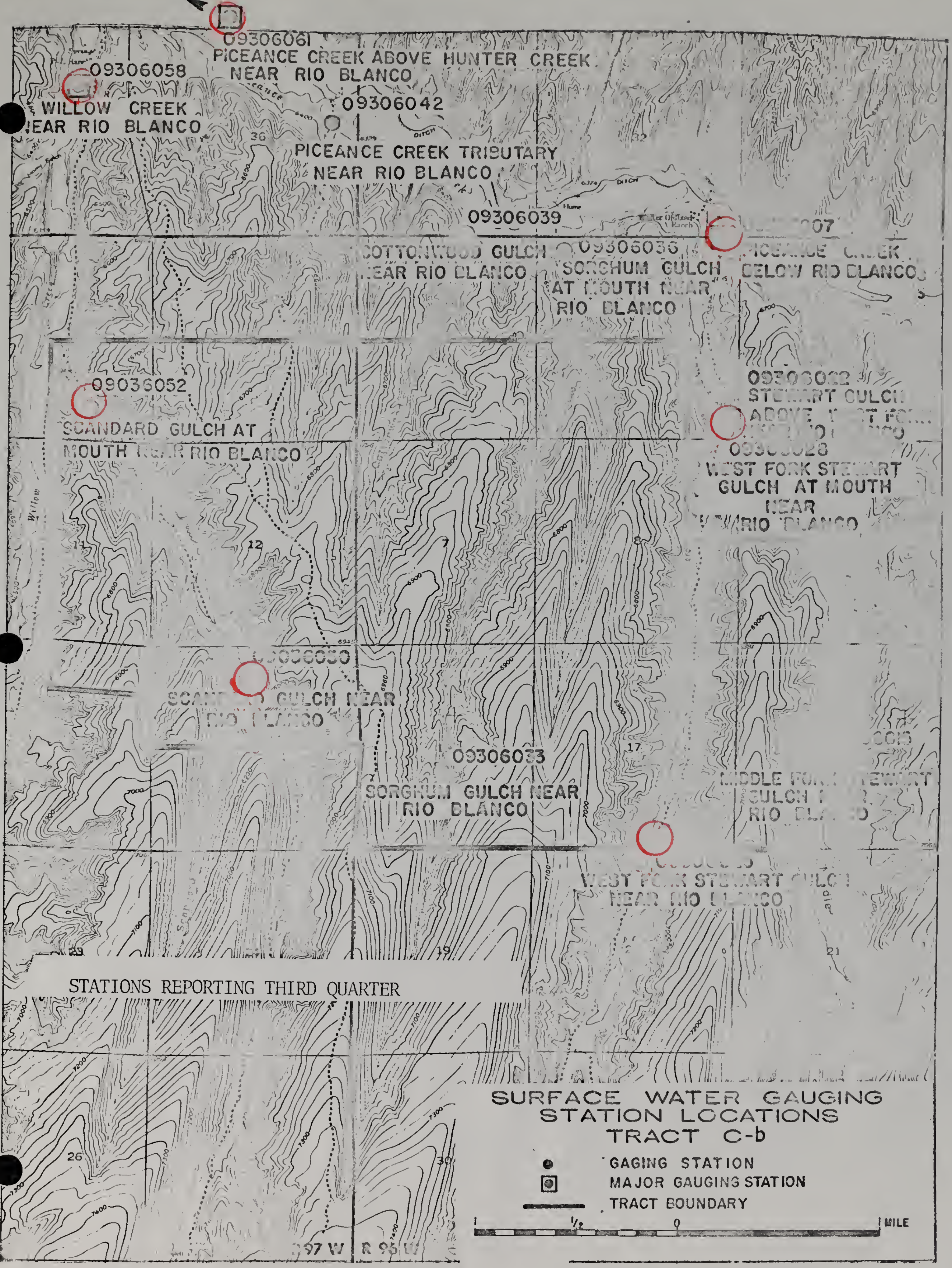
During the third-quarterly report period, water samples were obtained from eight of the thirteen stations on and near Tract C-b. The locations for all 13 stations are shown on Figure II A-1. The stations where water quality data were obtained this third quarter are identified by red circles on Figure II A-1 and are as follows.

U.S.G.S. 0936025
* U.S.G.S. 0936030
U.S.G.S. 0936050
U.S.G.S. 0936052
U.S.G.S. 0936007
U.S.G.S. 0936022
U.S.G.S. 0936058
U.S.G.S. 0936061

The latter four are located on perennial streams and are classified as major gauging stations.

Comparison of the results of major constituent analysis in the USGS's laboratory and in The Oil Shale Company's (TOSCO) laboratory is shown in Table IIA-14. The comparison between the two laboratories is excellent. A summary sheet for water quality is given for each station for each date a water sample was collected during the present quarterly reporting period or during the last quarter, but not reported in Quarterly Report #2. The number of constituents in the summary sheets does not correspond with the number of constituents reported by the U.S.G.S. Laboratory. Beginning with this Quarterly Report #3 the summary sheets have been modified to contain information only on required constituents. They therefore differ somewhat from those sheets used in Quarterly Report #2. It should be pointed out that the units used vary from element to element; the unit used (milligram vs. microgram per liter) should be ascertained before any analysis of the data is made.

* formerly in the vicinity of 0936022; relocated in the fall of 1974


09306061
PICEANCE CREEK ABOVE HUNTER CREEK NEAR RIO BLANCO
09306058
WILLOW CREEK NEAR RIO BLANCO
09306042
PICEANCE CREEK TRIBUTARY NEAR RIO BLANCO
09306039
COTTONWOOD GULCH NEAR RIO BLANCO
09306036
SORGHUM GULCH AT MOUTH NEAR RIO BLANCO
PICEANCE CREEK BELOW RIO BLANCO
09036052
SCANDARD GULCH AT MOUTH NEAR RIO BLANCO
STEWART GULCH ABOVE
WEST FORK STEWART GULCH AT MOUTH NEAR RIO BLANCO
SCANDARD GULCH NEAR RIO BLANCO
09306033
SORGHUM GULCH NEAR RIO BLANCO
MIDDLE FORK STEWART GULCH NEAR RIO BLANCO
WEST FORK STEWART GULCH NEAR RIO BLANCO
DITCH
Willow
R 97 W
R 96 W
GAGING STATION
MAJOR GAUGING STATION
TRACT BOUNDARY
1
1/2
0
1 MILE

STATIONS REPORTING THIRD QUARTER

SURFACE WATER GAUGING STATION LOCATIONS TRACT C-b

FIGURE II A-1

The analysis of the sample collected for U.S.G.S. station no. 0936058 on March 6, 1975 indicated a Gross Alpha determination greater than the level specified as requiring further testing, i.e., greater than 4 picocuries. (In such a situation it is required to analyze for Radium 226.) This is being done by the U.S.G.S. laboratory and will be reported in subsequent print-outs.

Minimum, maximum and mean concentrations for selected elements are reported in Tables II A-9 to II A-13. The mean is a weighted mean based on the number of samples available.

TABLE II-A-1

SURFACE WATER QUALITY
BASELINE DATA

BA[illegible]NE DATA TO BE
COLLECTED SEMI-MONTHLY

STATION: U.S.G.S. No. 09306007 Piceance Creek Below Rio Blanco
February 1975 - April 1975

	2/3	2/19	3/6	3/20	4/2									
1. Ammonia (mg/1) (Nitrogen)	.06	.07	.09	.03	.04									
2. Arsenic (ug/1)	5	1	2	4	2									
3. Barium (ug/1)	100	<100	200	<100	<100									
4. Bicarbonate (mg/1)	562	602	533	450	541									
5. Boron (ug/1)	190	220	220	220	240									
6. Cadmium (ug/1)	0	-	0	0	0									
7. Calcium (mg/1)	72	69	70	66	69									
8. Carbonate (mg/1)	0	0	0	32	0									
9. Chloride (mg/1)	19	17	15	16	15									
10. Chromium (ug/1)	0	-	0	0	0									
11. Color (PCU)	3	-	20	5	8									
12. Copper (ug/1)	1	-	2	1	1									
13. Cyanide (mg/1)	.00	.00	.00	.00	.00									
14. Fluoride (mg/1)	1.1	1.3	1.1	1.3	1.3									
15. Iron (ug/1)	20	60	90	10	20									
16. Kjeldahl Nitrogen (mg/1)	.61	.59	.86	.58	1.0									
17. Lead (ug/1)	6	-	3	2	1									
18. Lithium (ug/1)	20	-	10	20	20									
19. Magnesium (mg/1)	46	56	48	49	47									
20. Manganese (ug/1)	67	-	110	110	70									
21. Mercury (ug/1)	.1	--	.2	.0	.8									
22. Nitrate (mg/1) as NO_3	1.4	1.2	.97	.44	1.2									
23. Nitrite (mg/1) as NO_2	.03	.03	.03	.00	.00									
24. Odor	0	-	0	0	0									
25. Oil & Grease (mg/1)	6	10	6	3	3									
26. Ortho-Phosphorus (mg/1) (total)	.04	.04	.10	.03	.04									
27. Potassium (mg/1)	2.6	2.6	4.9	3.3	3.6									
28. Selenium (ug/1)	1	1	1	1	1									
29. Silica (mg/1)	16	16	14	12	14									
30. Sodium (mg/1)	130	130	120	120	120									
31. [illegible]lids, Dissolved (mg/1)	736	761	678	683	699									
32. [illegible]ulfate (mg/1)	170	170	140	160	160									
33. Sulfide (mg/1)	.1	.0	.2	.2	.2									
34. Turbidity (JTU)	10	80	20	20	130									
35. Zinc (ug/1)	20	-	10	20	20									
36. PH	9.0	8.5	8.0	8.5	8.5									

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan	-	-	-	-	-									
2. Radioactivity														
a. Gross Alpha (pcl) U Nat. Suspended	-	-	2.1	-	-									
Radium 226*														
b. Gross Beta Cs-137 & Sr90 Suspended	-	-	6.2											
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC) (mg/1)	-	-	8.4	-	-									
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD	-	-	35	-	-									
5. Coliform, Fecal	-	-	28	-	-									
6. Pesticides	-	-	-	-	-									

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-2

SURFACE WATER QUALITY
BASELINE DATA

ASELINE DATA TO BE
LLECTED SEMI-MONTHLY

STATION: U.S.G.S. No. 09306022 Stewart Gulch Ab West Fork Nr Rio Blanco Co.
February 1975 - April 1975

	2/3	2/19	3/6	3/20	4/2									
1. Ammonia (mg/1)(Nitrogen)	.06	.05	.03	.03	.01									
2. Arsenic (ug/1)	3	1	0	2	0									
3. Barium (ug/1)	<100	<100	<100	<100	<100									
4. Bicarbonate (mg/1)	519	516	510	437	497									
5. Boron (ug/1)	70	80	80	80	90									
6. Cadmium (ug/1)	1	1	0	0	1									
7. Calcium (mg/1)	98	93	95	97	95									
8. Carbonate (mg/1)	0	0	0	38	0									
9. Chloride (mg/1)	7.0	8.1	7.2	7.0	7.0									
10. Chromium (ug/1)	0	0	0	20	0									
11. Color (PCU)	3	3	20	8	0									
12. Copper (ug/1)	8	3	2	1	3									
13. Cyanide (mg/1)	.01	.02	.00	.00	.00									
14. Fluoride (mg/1)	.4	.3	.3	.1	.3									
15. Iron (ug/1)	10	10	40	20	30									
16. Kjeldahl Nitrogen (mg/1)	.45	.65	.46	.80	.36									
17. Lead (ug/1)	6	2	0	3	2									
18. Lithium (ug/1)	10	20	20	10	10									
19. Magnesium (mg/1)	78	76	81	86	74									
20. Manganese (ug/1)	40	30	30	30	10									
21. Mercury (ug/1)	.0	.0	.0	.0	.1									
22. Nitrate (mg/1) as NO_3	8.4	7.9	7.9	8.0	8.0									
23. Nitrite (mg/1) as NO_2	.03	.03	.03	.00	.00									
24. Odor	0	0	0	0	0									
25. Oil & Grease (mg/1)	9	8	7	4	3									
26. Ortho-Phosphorus (mg/1) (total)	.18	.05	.06	.03	.02									
27. Potassium (mg/1)	1.6	1.5	1.7	1.6	2.4									
28. Selenium (ug/1)	1	1	1	1	1									
29. Silica (mg/1)	16	15	15	14	15									
30. Sodium (mg/1)	120	120	120	120	120									
31. Solids, Dissolved (mg/1)	956	957	950	958	937									
[illegible] Sulfate (mg/1)	370	380	370	370	370									
[illegible] Sulfide (mg/1)	.1	.0	.1	.1	.2									
34. Turbidity (JTU)	5	30	10	16	17									
35. Zinc (ug/1)	20	60	20	30	20									
36. PH	8.8	8.5	8.1	8.4	8.6									

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan														
2. Radioactivity														
a. Gross Alpha (pcl) Suspended U Nat	-	-	1.7	-	-									
Radium 226*														
b. Gross Beta CS-137 & Sr	-	-	4.5	-	-									
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC) (mg/1)	-	-	3.1	-	-									
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD	-	-	10	-	-									
5. Coliform, Fecal	-	-	0	-	-									
6. Pesticides	-	-	-	-	-									

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-3

SURFACE WATER QUALITY
BASELINE DATA

ASELINE DATA TO BE
OLLECTED SEMI-MONTHLY

STATION: U.S.G.S. No. 09306025 West Fork Stewart Gulch Nr. Rio Blanco Co.
November 1974

	11/6	11/20												
1. Ammonia (mg/1) (Nitrogen)														
2. Arsenic (ug/1)	1	2												
3. Barium (ug/1)	<100	<100												
4. Bicarbonate (mg/1)	488	757												
5. Boron (ug/1)	90	130												
6. Cadmium (ug/1)	1	1												
7. Calcium (mg/1)	82	130												
8. Carbonate (mg/1)	-	-												
9. Chloride (mg/1)	9.4	12												
10. Chromium (ug/1)	-	-												
11. Color (PCU)														
12. Copper (ug/1)	1	1												
13. Cyanide (mg/1)														
14. Fluoride (mg/1)	.2	.2												
15. Iron (ug/1)	210	20												
16. Kjeldahl Nitrogen (mg/1)														
17. Lead (ug/1)	3	11												
18. Lithium (ug/1)	0	0												
19. Magnesium (mg/1)	84	120												
20. Manganese (ug/1)	0	10												
21. Mercury (ug/1)	.0	.0												
22. Nitrate (mg/1) as NO_3														
23. Nitrite (mg/1) as NO_2														
24. Odor	0	-												
25. Oil & Grease (mg/1)														
26. Ortho-Phosphorus (mg/1) as P	.02	.02												
27. Potassium (mg/1)	3.1	3.7												
28. Selenium (ug/1)	5	0												
29. Silica (mg/1)	13	17												
30. Sodium (mg/1)	130	200												
31. Solids, Dissolved (mg/1)	943	1450												
[illegible] Sulfate (mg/1)	380	590												
33. Sulfide (mg/1)														
34. Turbidity (JTU)														
35. Zinc (ug/1)	40	20												
36. PH	8.2	-												

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan	-	-												
2. Radicactivity														
a. Gross Alpha (pcl)														
Radium 226*														
b. Gross Beta														
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC) (mg/1)														
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD														
5. Coliform, Fecal														
6. Pesticides														

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-4

SURFACE WATER QUALITY
BASELINE DATA

SELINE DATA TO BE
LLECTED SEMI-MONTHLY

STATION: U.S.G.S. 09306030 Stewart Gulch Nr Rio Blanco, Co.
December 1974

	12/4													
1. Ammonia (mg/l) (Nitrogen)														
2. Arsenic (ug/l)														
3. Barium (ug/l)	60													
4. Bicarbonate (mg/l)														
5. Boron (ug/l)	35													
6. Cadmium (ug/l)	<20													
7. Calcium (mg/l)														
8. Carbonate (mg/l)														
9. Chloride (mg/l)														
10. Chromium (ug/l)	<6													
11. Color (PCU)														
12. Copper (ug/l)	2													
13. Cyanide (mg/l)														
14. Fluoride (mg/l)														
15. Iron (ug/l)	13													
16. Kjeldahl Nitrogen (mg/l)														
17. Lead (ug/l)	<6													
18. Lithium (ug/l)	5													
19. Magnesium (mg/l)														
20. Manganese (ug/l)	<4													
21. Mercury (ug/l)														
22. Nitrate (mg/l)														
23. Nitrite (mg/l)														
24. Odor														
25. Oil & Grease (mg/l)														
26. Ortho-Phosphorus (mg/l)														
27. Potassium (mg/l)														
28. Selenium (ug/l)														
29. Silica (mg/l)														
30. Sodium (mg/l)														
Solids, Dissolved (mg/l)														
Sulfate (mg/l)														
33. Sulfide (mg/l)														
34. Turbidity (JTU)														
35. Zinc (ug/l)	<20													

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan														
2. Radioactivity														
a. Gross Alpha (pcl)														
Radium 226*														
b. Gross Beta														
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC)														
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD														
5. Coliform, Fecal														
6. Pesticides														

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-5

SURFACE WATER QUALITY
BASELINE DATA

BASELINE DATA TO BE
[illegible]LLECTED SEMI-MONTHLY

STATION: U.S.G.S. 09306050 Scandard Gulch Nr Rio Blanco, Co.
June 1974 and March 1975

	6/21		3/5											
1. Ammonia (mg/l) (Nitrogen)														
2. Arsenic (ug/l)	4		-											
3. Barium (ug/l)	0		-											
4. Bicarbonate (mg/l)	444		162											
5. Boron (ug/l)	140		110											
6. Cadmium (ug/l)	2		-											
7. Calcium (mg/l)	91		23											
8. Carbonate (mg/l)	46		0											
9. Chloride (mg/l)	10		3.2											
10. Chromium (ug/l)														
11. Color	-		200											
12. Copper (ug/l)	4		-											
13. Cyanide	-		.00											
14. Fluoride (mg/l)	.3		2.4											
15. Iron (ug/l)	20		-											
16. Kjeldahl Nitrogen (mg/l)	-		15											
17. Lead (ug/l)	6		-											
18. Lithium (ug/l)	10		-											
19. Magnesium (mg/l)	79		4.4											
20. Manganese (ug/l)	20		-											
21. Mercury (ug/l)	.0		-											
22. Nitrate (mg/l) as NO_3	-		.84											
23. Nitrite (mg/l) as NO_2	-		.30											
24. Odor	-		0											
25. Oil & Grease (mg/l)	-		4											
26. Ortho-Phosphorus (mg/l) (total)	.01		.32											
27. Potassium (mg/l)	2.2		-											
28. Selenium (ug/l)	2		0											
29. Silica (mg/l)	13		8.4											
30. Sodium (mg/l)	140		42											
31. Solids, Dissolved (mg/l)	951		176											
[illegible] Sulfate (mg/l)	350		10											
[illegible]. Sulfide (mg/l)														
34. Turbidity (JTU)	-		1100											
35. Zinc (ug/l)	20		-											
36. PH	8.4		-											

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan														
2. Radioactivity														
a. Gross Alpha (pcl)														
Radium 226*														
b. Gross Beta														
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC)														
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD														
5. Coliform, Fecal														
6. Pesticides														

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-6

SURFACE WATER QUALITY
BASELINE DATA

BASELINE DATA TO BE
[illegible]LLECTED SEMI-MONTHLY

STATION: U.S.G.S. 09306052 Scandard Gulch at Mouth, Nr Rio Blanco, Co.
March 1975

	3/5													
1. Ammonia (mg/l) (Nitrogen)														
2. Arsenic (ug/l)														
3. Barium (ug/l)														
4. Bicarbonate (mg/l)	206													
5. Boron (ug/l)	170													
6. Cadmium (ug/l)														
7. Calcium (mg/l)	23													
8. Carbonate (mg/l)	0													
9. Chloride (mg/l)	13													
10. Chromium (ug/l)														
11. Color (PCU)	200													
12. Copper (ug/l)														
13. Cyanide	.00													
14. Fluoride (mg/l)	3.5													
15. Iron (ug/l)														
16. Kjeldahl Nitrogen (mg/l)	23													
17. Lead (ug/l)														
18. Lithium (ug/l)														
19. Magnesium (mg/l)	5.0													
20. Manganese (ug/l)														
21. Mercury (ug/l)														
22. Nitrate (mg/l) as NO_3	.58													
23. Nitrite (mg/l) as NO_2	.23													
24. Odor	0													
25. Oil & Grease (mg/l)	5													
26. Ortho-Phosphorus (mg/l) (total)	.52													
27. Potassium (mg/l)														
28. Selenium (ug/l)														
29. Silica (mg/l)	8.3													
30. Sodium (mg/l)	55													
31. Solids, Dissolved (mg/l)	223													
Sulfate (mg/l)	11													
Sulfide (mg/l)														
34. Turbidity JTU	960													
35. Zinc (ug/l)														

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan														
2. Radioactivity														
a. Gross Alpha (pcl)														
Radium 226*														
b. Gross Beta														
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC)														
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD														
5. Coliform, Fecal														
6. Pesticides														

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-7

SURFACE WATER QUALITY
BASELINE DATA

ASELINE DATA TO BE
OLLECTED SEMI-MONTHLY

STATION: U.S.G.S. 09306058 Willow Creek Nr Rio Blanco, Co.
February - April 1975

	2/3	2/9	3/6	3/20	4/3	4/15
1. Ammonia (mg/1) (Nitrogen)	.08	.03	.08	.02	.01	.02
2. Arsenic (ug/1)	4	0	0	2	1	3
3. Barium (ug/1)	100	100	100	<100	100	<100
4. Bicarbonate (mg/1)	531	536	537	496	509	484
5. Boron (ug/1)	110	130	100	100	110	120
6. Cadmium (ug/1)	1	1	0	0	0	0
7. Calcium (mg/1)	100	96	94	97	98	98
8. Carbonate (mg/1)	0	0	0	0	0	0
9. Chloride (mg/1)	12	11	9.9	11	9.7	12
10. Chromium (ug/1)	0	10	0	10	0	0
11. Color (PCU)	0	5	20	5	3	3
12. Copper (ug/1)	4	4	1	1	1	0
13. Cyanide (mg/1)	.00	.00	.00	.00	.00	.01
14. Fluoride (mg/1)	.3	.4	.4	.6	.4	.3
15. Iron (ug/1)	10	20	50	10	20	10
16. Kjeldahl Nitrogen (mg/1)	1.0	1.1	1.2	.73	.99	.51
17. Lead (ug/1)	2	2	2	3	1	0
18. Lithium (ug/1)	0	10	10	10	10	10
19. Magnesium (mg/1)	74	74	75	79	72	74
20. Manganese (ug/1)	30	20	50	30	10	0
21. Mercury (ug/1)	.2	.0	.0	.0	.0	.0
22. Nitrate (mg/1) as NO_3	1.9	1.6	1.7	1.7	1.4	.93
23. Nitrite (mg/1) as NO_2	.00	.00	.03	.00	.00	.03
24. Odor	0	0	0	0	0	0
25. Oil & Grease (mg/1)	5	7	4	3	5	2
26. Ortho-Phosphorus (mg/1) Total	.00	.07	.10	.04	.03	.04
27. Potassium (mg/1)	2.3	1.8	3.8	3.0	3.3	1.8
28. Selenium (ug/1)	1	0	1	1	0	1
29. Silica (mg/1)	17	15	14	14	15	14
30. Sodium (mg/1)	120	110	110	110	110	110
Solids, Dissolved (mg/1)	940	915	894	901	901	860
Sulfate (mg/1)	350	340	320	340	340	310
33. Sulfide (mg.1)	.1	.1	.3	.1	.0	.2
34. Turbidity (JTU)	30	200	100	55	40	33
35. Zinc (ug/1)	30	50	30	10	30	30
36. PH	7.5	7.9	8.2	8.2	8.2	8.3

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan			
2. Radioactivity			
a. Gross Alpha (pcl) as U Natural	-	-	26
Radium 226*			
b. Gross Beta as CS-137 & Sr90	-	-	38
Thorium 230**			
Uranium**			
3. Total Organic Carbon (TOC) (mg/1)	-	-	16
If TOC> 10 mg/liter, then			
a. Nitrogen (Base Extraction)			
b. Organic Carbon, Dissolved			
c. Organic Carbon, Suspended			
d. Phenols			
e. Polycyclic Aromatics			
f. Sulfur (Acid Extraction)			
4. COD	-	-	38
5. Coliform, Fecal	-	-	5
6. Pesticides	-	-	-

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-8

SURFACE WATER QUALITY
BASELINE DATA

ASELINE DATA TO BE
COLLECTED SEMI-MONTHLY

STATION: U.S.G.S. 09306061 Piceance Creek Ab Hunter Creek Nr Rio Blanco, Co.
February - April 1975

	2/3	2/19	3/6	3/20	4/3									
1. Ammonia (mg/l) (Nitrogen)	.04	.03	.09	.03	.04									
2. Arsenic (ug/l)	5	1	1	0	0									
3. Barium (ug/l)	<100	<100	100	<100	<100									
4. Bicarbonate (mg/l)	591	571	554	475	576									
5. Boron (ug/l)	150	160	170	160	150									
6. Cadmium (ug/l)	1	1	0	0	0									
7. Calcium (mg/l)	88	84	81	82	83									
8. Carbonate (mg/l)	0	0	0	39	0									
9. Chloride (mg/l)	13	14	13	14	14									
10. Chromium (ug/l)	10	0	0	0	0									
11. Color (PCU) (PCU)	-	5	30	8	3									
12. Copper (ug/l)	5	10	2	2	1									
13. Cyanide (mg/l)	.00	.03	.00	.00	.00									
14. Fluoride (mg/l)	.6	.7	.7	.9	.7									
15. Iron (ug/l)	30	20	60	30	10									
16. Kjeldahl Nitrogen (mg/l)	.46	1.9	.99	.61	.79									
17. Lead (ug/l)	2	1	2	3	0									
18. Lithium (ug/l)	10	20	20	20	10									
19. Magnesium (mg/l)	67	70	64	70	64									
20. Manganese (ug/l)	40	30	30	30	0									
21. Mercury (ug/l)	.1	.0	.0	.0	.0									
22. Nitrate (mg/l) as NO_3	3.0	3.5	2.7	2.9	2.6									
23. Nitrite (mg/l) as NO_2	.03	.00	.03	.03	.00									
24. Odor	0	0	0	0	0									
25. Oil & Grease (mg/l)	8	4	4	3	2									
26. Ortho-Phosphorus (mg/l) (total)	--	.06	.10	.04	.04									
27. Potassium (mg/l)	2.7	2.6	4.8	3.9	5.0									
28. Selenium (ug/l)	1	1	1	1	1									
29. Silica (mg/l)	17	16	15	13	15									
30. Sodium (mg/l)	140	140	130	130	140									
. Solids, Dissolved (mg/l)	944	923	835	851	889									
. Sulfate (mg/l)	320	310	250	260	280									
33. Sulfide (mg/l)	.2	.0	.2	.1	.1									
34. Turbidity (JTU)	10	300	50	50	50									
35. Zinc (ug/l)	30	40	10	20	20									
36. PH	7.5	8.0	8.1	8.7	7.8									

DATA TO BE OBTAINED QUARTERLY
AT FOUR MAJOR STATIONS

1. Complete Element Scan														
2. Radioactivity														
a. Gross Alpha (pcl) as U Natural	-	-	8.1	-	-									
Radium 226*														
b. Gross Beta as Cs-137 & Sr90	-	-	126	-	-									
Thorium 230**														
Uranium**														
3. Total Organic Carbon (TOC)	-	-	8.2	-	-									
If TOC> 10 mg/liter, then														
a. Nitrogen (Base Extraction)														
b. Organic Carbon, Dissolved														
c. Organic Carbon, Suspended														
d. Phenols														
e. Polycyclic Aromatics														
f. Sulfur (Acid Extraction)														
4. COD	-	-	24	-	-									
5. Coliform, Fecal	-	-	12	-	-									
6. Pesticides	-	-	-	-	-									

* Required if Gross Alpha> 4 picocuries per liter (pcl)
** Required if Gross Beta >1000 picocuries per liter (pcl)
N Non-Instantaneous Discharge

TABLE II A-9
MINIMUM-MAXIMUM AND MEAN CONCENTRATIONS FOR SELECTED WATER QUALITY CONSTITUENTS

U.S.G.S. NO. 09306007
PICEANCE CREEK BELOW RIO BLANCO, CO.
April 23, 1974 to April 2, 1975
Elevation - 6366 ft. above MSL

Total No. of Samples		Minimum	Mean	Maximum
34	Temperature (°C)	0.0	10.0	22.0
31	Discharge (CFS)	2.9	9.5	34
9	Turbidity (JTU) Dec. 1974-April 1975	6	20	130
33	Specific Conductivity (micromhos)	912	1160	1270
30	Dissolved Oxygen (mg/l)	7.0	10.2	13.0
33	pH	6.9	8.2	9.0
33	Alkalinity (mg/l)	358	445	506
33	Bicarbonate (mg/l)	436	542	617
23	Carbonate (mg/l)	0	0	32
9	Nitrate (NO_3) (mg/l) Dec. 1974-April 1975	0.44	1.4	2.5
34	Orthophosphate (mg/l)	0.00	0.06	1.1
34	Calcium (mg/l)	51	70	77
34	Magnesium (mg/l)	38	47	57
34	Sodium (mg/l)	88	130	160
34	Potassium (mg/l)	2.4	3.4	19
34	Chloride (mg/l)	9.7	16	24
34	Sulfate (mg/l)	130	170	200
34	Fluoride (mg/l)	0.2	1.0	1.3
34	Silica (mg/l)	3.4	16	18
34	Iron (ug/l)	10	50	390
33	Manganese (ug/l)	10	110	230
33	Dissolved Solids (mg/l)	578	718	829

TABLE II A-10
MINIMUM-MAXIMUM AND MEAN CONCENTRATIONS FOR SELECTED WATER QUALITY CONSTITUENTS

U.S.G.S. NO. 09306022
STEWART GULCH ab WEST FORK nr RIO BLANCO, CO.
September 12, 1974 to April 2, 1975

Total No. of Samples		Minimum	Mean	Maximum
19	Temperature (°C)	1.0	8.0	12.0
17	Discharge (CFS)	1.3	2.1	2.7
9	Turbidity (JTU) Dec. 1974-April 1975	3	10	30
19	Specific Conductivity (micromhos)	750	1370	1750
19	Dissolved Oxygen (mg/1)	7.9	10.2	14.0
19	pH	7.2	8.2	8.8
19	Alkalinity (mg/1)	387	421	641
19	Bicarbonate (mg/1)	437	511	782
9	Carbonate (mg/1)	0	0	38
9	Nitrate (NO_3) (mg/1) Dec. 1974-April 1975	7.5	7.9	8.4
19	Orthophosphate (mg/1)	0.00	0.03	0.15
19	Calcium (mg/1)	73	95	99
19	Magnesium (mg/1)	64	76	86
19	Sodium (mg/1)	120	120	250
19	Potassium (mg/1)	1.1	1.9	2.5
19	Chloride (mg/1)	6.0	7.0	16
19	Sulfate (mg/1)	330	370	380
19	Fluoride (mg/1)	0.1	0.3	3.3
19	Silica (mg/1)	14	15	17
19	Iron (ug/1)	10	20	620
19	Manganese (ug/1)	0	10	40
19	Dissolved Solids (mg/1)	865	950	1160

TABLE II A-11
MINIMUM-MAXIMUM AND MEAN CONCENTRATIONS FOR SELECTED WATER QUALITY CONSTITUENTS

U.S.G.S. NO. 09306025
WEST FORK STEWART GULCH NEAR RIO BLANCO, CO.
May 3, 1974 to November 20, 1974
Elevation - 6668 ft. above MSL

Total No. of Samples		Minimum	Mean	Maximum
21	Temperature (°C)	0.0	12.0	30.0
17	Discharge (CFS)	0.02	0.03	0.15
--	Turbidity (JTU) Dec. 1974-April 1975	-NR-	-NR-	-NR-
21	Specific Conductivity (micromhos)	1460	1620	2070
20	Dissolved Oxygen (mg/l)	6.6	8.8	13.5
20	pH	7.4	8.2	8.8
21	Alkalinity (mg/l)	374	437	621
21	Bicarbonate (mg/l)	438	533	757
12	Carbonate (mg/l)	0	0	13
	Nitrate (NO_3) (mg/l) Dec. 1974-April 1975	-NR-	-NR-	-NR-
21	Orthophosphate (mg/l)	0.00	0.06	0.12
21	Calcium (mg/l)	48	95	130
21	Magnesium (mg/l)	84	100	120
21	Sodium (mg/l)	130	160	220
21	Potassium (mg/l)	1.2	2.8	9.8
21	Chloride (mg/l)	7.6	10	29
21	Sulfate (mg/l)	380	480	590
21	Fluoride (mg/l)	0.0	0.2	1.2
21	Silica (mg/l)	8.9	15	18
21	Iron (ug/l)	20	40	210
21	Manganese (ug/l)	0	0	20
21	Dissolved Solids (mg/l)	943	1130	1450

NR - Not Recorded (not a major station)

TABLE II A-12
MINIMUM-MAXIMUM AND MEAN CONCENTRATIONS FOR SELECTED WATER QUALITY CONSTITUENTS

U.S.G.S. NO. 09306058
WILLOW CREEK nr RIO BLANCO, CO.
April 23, 1974 to April 3, 1975
Elevation - 6273 ft. above MSL

Total No. of Samples		Minimum	Mean	Maximum
30	Temperature (°C)	0.0	11.0	18.5
25	Discharge (CFS)	0.56	1.1	4.1
9	Turbidity (JTU) Dec. 1974-April 1975	9	40	200
29	Specific Conductivity (micromhos)	1200	1390	1590
29	Dissolved Oxygen (mg/l)	7.7	10.0	12.6
29	pH	7.5	8.0	8.7
30	Alkalinity (mg/l)	395	425	476
30	Bicarbonate (mg/l)	482	515	580
22	Carbonate (mg/l)	0	0	9
9	Nitrate (NO_3) (mg/l) Dec. 1974-April 1975	1.4	1.8	2.7
30	Orthophosphate (mg/l)	0.00	0.03	0.15
30	Calcium (mg/l)	64	97	100
30	Magnesium (mg/l)	70	76	87
30	Sodium (mg/l)	110	130	180
30	Potassium (mg/l)	1.1	2.3	5.0
30	Chloride (mg/l)	9.3	11	14
30	Sulfate (mg/l)	320	350	500
30	Fluoride (mg/l)	0.2	0.4	1.3
30	Silica (mg/l)	8.2	16	18
30	Iron (ug/l)	0	30	320
30	Manganese (ug/l)	0	20	70
30	Dissolved Solids (mg/l)	875	934	1150

TABLE II A-13
MINIMUM-MAXIMUM AND MEAN CONCENTRATIONS FOR SELECTED WATER QUALITY CONSTITUENTS

U.S.G.S. No. 09306061
PICEANCE CREEK Ab HUNTER CREEK, Nr RIO BLANCO, CO.
April 23, 1974 to April 3, 1975
Elevation - 6214 ft. above MSL

Total No. of Samples		Minimum	Mean	Maximum
29	Temperature (^{O}C)	0.0	14.0	23.0
22	Discharge (CFS)	4.6	6.3	31
6	Turbidity (JTU) Dec. 1974-April 1975	10	50	300
29	Specific Conductivity (micromhos)	1140	1400	1660
27	Dissolved Oxygen (mg/l)	6.8	9.6	16.0
29	pH	7.5	8.2	8.7
29	Alkalinity (mg/l)	363	493	566
29	Bicarbonate (mg/l)	443	601	690
18	Carbonate (mg/l)	0	0	39
6	Nitrate (NO_3) (mg/l) Dec. 1974-April 1975	2.6	2.9	3.5
29	Orthophosphate (mg/l)	0.00	0.09	0.25
29	Calcium (mg/l)	59	79	88
29	Magnesium (mg/l)	47	69	88
29	Sodium (mg/l)	120	160	200
29	Potassium (mg/l)	1.2	3.9	6.4
29	Chloride (mg/l)	11	14	16
29	Sulfate (mg/l)	220	300	380
29	Fluoride (mg/l)	0.3	0.7	1.5
29	Silica (mg/l)	12	17	20
29	Iron (ug/l)	10	30	880
29	Manganese (ug/l)	0	60	190
29	Dissolved Solids (mg/l)	736	944	1090

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

LABORATORY DATA LETTER 75-91

FROM: F. C. Haas
DATE: May 7, 1975
FILE NO.:
TO: File
SUBJECT: Comparative Water Analyses Between USGS and TOSCO

Project No. 197

Several months ago the USGS submitted several samples to us for total organic carbon analysis. Results were reported in Laboratory Data Letter 75-24.

We also analyzed two of the samples for major constituents as a check for us and also the USGS. Both samples were from the Piceance Creek near C-b tract.

Comparison of results between the two labs is excellent; data is attached.

FCH/br

Enc.

Approved (MTA)

cc: Mr. R. G. Vawter
Dr. B. L. Schulman
Mr. H. M. Spence
Mr. T. H. Cleveland
Mr. A. W. Schillinger
Mr. M. W. Legatski
Mr. D. B. Tait
Mr. J. R. Matis

TABLE II A-14
COMPARISON OF RESULTS FROM TOSCO & USGS LABORATORIES
GROUND WATER QUALITY

Component, mg/l	Piceance Creek Below Rio Blanco (No. 09306007, 1-15-75)		Piceance Creek AB Hunter C (No. 09306061, 1-16-75)	
	USGS	TOSCO	USGS	TOSCO
Sodium	130	124	140	141
Potassium	3.4	3.4	2.6	2.6
Calcium	74	65	79	72
Magnesium	46	51	64	75
Sulfate	160	167	290	294
Carbonate	0	9	0	5
Bicarbonate	552	523	545	545
Chloride	16	14	12	13
Fluoride	1.2	1.2	0.7	0.7
Borate	0.9	0.8	0.8	0.8
Cations, meq/l	13.22	12.93	15.37	15.97
Anions, meq/l	12.92	12.83	15.35	15.65
% Difference	1.1	0.4	0.1	1.0
Silica, mg/l	17	17	17	17
pH	8.1	8.4	8.1	8.4
Calculated TDS, mg/l	719	709	873	888

PROCESS DAT[illegible]/04/75
DISTRICT CODE 08

09306007 - PICEANCE CREE[illegible]ELOW RIO BLANCO, CO.

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPER-ATURE (DEG C) (00010)	DIS-CHARGE (CFS) (00060)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	CHEM-ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L) (00340)	PH (UNITS) (00400)
APR., 1974												
23...	1230	2	--	10.0	--	25	--	--	977	--	--	8.2
MAY												
03...	1100	2	--	7.5	--	34	--	--	912	7.0	--	8.2
17...	1130	2	--	9.0	12	--	--	--	1080	9.4	--	8.2
22...	1100	2	1881	11.0	--	6.6	--	--	1240	10.2	--	8.1
31...	1230	2	--	15.0	--	6.4	--	--	1220	12.2	--	8.3
JUNE												
14...	1210	2	--	19.0	6.9	--	--	--	1190	10.8	--	8.2
21...	--	2	--	19.0	--	7.0	--	--	1200	12.6	--	8.2
26...	1030	2	--	16.0	7.3	--	--	--	1270	10.4	--	8.3
JULY												
02...	0900	2	--	10.5	--	6.4	--	--	1250	10.4	--	8.2
11...	1530	2	--	22.0	--	4.0	--	--	1250	10.6	--	8.1
20...	1445	2	--	20.0	--	14	--	--	1030	8.0	--	7.8
AUG.												
03...	0915	2	--	13.0	8.0	--	--	--	1210	8.9	--	8.1
10...	1245	2	--	14.0	28	--	--	--	1020	8.0	--	8.2
16...	1600	2	--	21.0	--	7.4	--	--	1010	7.6	--	8.0
31...	1630	2	--	19.5	--	8.4	--	--	--	9.8	--	6.9
SEP.												
20...	1000	2	--	8.0	--	7.1	--	--	1080	9.8	--	8.1
27...	1100	2	--	7.0	--	8.1	--	--	1060	10.2	--	8.3
OCT.												
04...	1330	2	--	13.0	--	--	--	--	1140	9.2	--	8.4
09...	1340	2	--	14.0	--	2.9	--	--	1190	10.0	--	8.5
16...	1420	2	--	13.0	--	4.1	--	--	1160	10.0	--	8.7
23...	1300	2	--	11.0	--	5.3	--	--	1160	9.5	--	8.2
31...	1000	2	--	5.0	--	--	--	--	1180	8.8	--	8.5
NOV.												
06...	1000	2	--	5.0	--	6.0	--	--	1200	--	--	--
20...	1200	2	--	4.0	--	9.5	--	--	1090	11.0	--	8.0
DEC.												
04...	1340	2	751800	4.0	--	9.8	20	5	1070	11.0	9	8.2
18...	0910	2	--	.0	--	11	20	2	1200	10.5	--	8.4
31...	1200	2	--	1.0	--	7.8	6	3	1100	13.0	--	8.3
JAN., 1975												
15...	--	2	--	1.0	--	9.5	30	5	1200	12.4	--	8.1
FEB.												
03...	1155	2	--	1.0	--	12	10	3	1120	9.9	--	9.0
19...	1100	2	--	5.0	--	11	80	--	1180	--	--	8.5

09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DAT

DATE	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKALINITY AS CACO3 (MG/L) (00410)	BICARBONATE (HCO3) (MG/L) (00440)	CARBONATE (CO3) (MG/L) (00445)	TOTAL FILTRABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILTRABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DISSOLVED AMMONIA NITROGEN (N) (MG/L) (00608)	DISSOLVED NITRITE (N) (MG/L) (00613)	DISSOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJELDAHL NITROGEN (N) (MG/L) (00625)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)
APR., 1974												
23...	4.6	374	456	0	--	--	--	--	--	--	--	.63
MAY												
03...	4.4	358	436	0	--	--	--	--	--	--	--	.70
17...	5.2	423	516	0	--	--	--	--	--	--	--	.56
22...	7.6	491	599	0	--	--	--	--	--	--	--	.28
31...	4.8	492	600	0	--	--	--	--	--	--	--	.15
JUNE												
14...	5.9	476	580	0	--	--	--	--	--	--	--	.08
21...	5.8	472	576	0	--	--	--	--	--	--	--	.03
26...	4.7	481	587	0	--	--	--	--	--	--	--	.04
JULY												
02...	6.2	506	617	0	--	--	--	--	--	--	--	.01
11...	7.5	481	587	0	--	--	--	--	--	--	--	2.5
20...	11	362	441	0	--	--	--	--	--	--	--	.47
AUG.												
03...	7.6	468	595	0	--	--	--	--	--	--	--	.15
10...	5.0	408	497	0	--	--	--	--	--	--	--	.69
16...	7.4	381	465	--	--	--	--	--	--	--	--	.40
31...	--	--	--	--	--	--	--	--	--	--	--	.12
SEP.												
20...	6.6	428	522	--	--	--	--	--	--	--	--	.23
27...	4.0	412	502	--	--	--	--	--	--	--	--	.21
OCT.												
04...	3.4	440	537	--	--	--	--	--	--	--	--	.07
09...	2.8	462	563	--	--	--	--	--	--	--	--	.03
16...	1.7	449	548	--	--	--	--	--	--	--	--	.02
23...	5.5	445	542	--	--	--	--	--	--	--	--	.00
31...	2.9	478	583	--	--	--	--	--	--	--	--	.04
NOV.												
06...	--	472	576	--	--	--	--	--	--	--	--	.07
20...	8.4	430	524	--	--	--	--	--	--	--	--	.26
DEC.												
04...	5.2	424	517	0	670	72	0	.03	.00	.38	.30	.38
18...	3.4	442	539	0	--	--	1	.04	.02	.33	.33	.35
31...	4.4	454	554	0	--	--	1	.08	.00	.43	.25	.43
JAN., 1975												
15...	7.0	453	552	0	--	--	8	.13	.01	.56	.48	.57
FEB.												
03...	.9	461	562	0	--	--	6	.06	.01	.32	.61	.33
19...	3.0	494	602	0	--	--	10	.07	.01	.28	.59	.29

09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DA

DATE	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)	PERCENT SODIUM (00932)
APR., 1974												
23...	.06	--	.02	--	--	340	0	69	40	96	2.3	38
MAY												
03...	.03	--	.01	--	--	320	0	66	38	88	2.1	37
17...	.09	--	.03	--	--	380	0	74	47	110	2.5	38
22...	.12	--	.04	--	--	410	0	77	52	140	3.0	43
31...	.18	--	.06	--	--	410	0	76	53	140	3.0	42
JUNE												
14...	.06	--	.02	--	--	400	0	73	52	150	3.3	45
21...	.03	--	.01	--	--	390	0	76	49	140	3.1	44
26...	.06	--	.02	--	--	400	0	76	50	150	3.3	45
JULY												
02...	.00	--	.00	--	--	420	0	74	56	150	3.2	44
11...	1.1	--	.36	--	--	410	0	72	57	160	3.4	45
20...	.12	--	.04	--	--	340	0	73	39	110	2.6	41
AUG.												
03...	.06	--	.02	--	--	390	0	75	48	140	3.1	44
10...	.12	--	.04	--	--	350	0	69	42	110	2.6	41
16...	.03	--	.01	--	--	340	0	65	42	120	2.9	44
31...	.03	--	.01	--	--	320	--	51	47	130	3.2	44
SEP.												
20...	.06	--	.02	--	--	380	0	70	50	120	2.7	40
27...	.03	--	.01	--	--	340	0	63	44	110	2.6	41
OCT.												
04...	.00	--	.00	--	--	370	0	69	49	140	3.2	45
09...	.03	--	.01	--	--	350	0	69	43	150	3.5	48
16...	.00	--	.00	--	--	380	0	70	50	140	3.1	44
23...	.00	--	.00	--	--	360	0	68	46	130	3.0	44
31...	.09	--	.03	--	--	400	0	76	50	140	3.1	43
NOV.												
06...	.09	--	.03	--	--	360	0	75	42	140	3.2	46
20...	.03	--	.01	--	--	350	0	71	42	130	3.0	44
DEC.												
04...	.06	.05	.02	.00	.0	330	0	58	45	120	2.9	44
18...	.09	.09	.03	.00	.5	390	0	76	48	130	2.9	42
31...	.15	.05	.05	.00	.9	360	0	73	43	120	2.8	42
JAN., 1975												
15...	.06	.08	.02	.00	.0	370	0	74	46	130	2.9	43
FEB.												
03...	.12	.16	.04	.00	.1	370	0	72	46	130	2.9	43
19...	.12	.09	.04	.00	.0	400	0	69	56	130	2.8	41

09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY D

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)
APR., 1974												
23...	2.7	13	160	1.3	15	--	--	--	--	--	--	--
MAY												
03...	3.1	9.7	140	.7	14	--	--	--	--	--	--	--
17...	3.4	12	180	.8	17	2	--	--	--	--	--	--
22...	2.9	15	190	.9	17	1	130	<6	<11	200	0	<8
31...	4.3	17	180	.9	17	2	200	--	--	240	1	--
JUNE												
14...	3.7	15	180	1.0	15	1	200	--	--	250	0	--
21...	3.4	17	180	.9	13	3	0	--	--	260	1	--
26...	4.1	16	180	.9	16	2	<100	--	--	250	2	--
JULY												
02...	3.5	16	190	.8	14	5	<100	--	--	250	0	--
11...	3.8	17	200	.2	17	4	<100	--	--	280	1	--
20...	5.7	16	190	.7	15	3	0	--	--	260	1	--
AUG.												
03...	3.9	16	190	.9	18	2	0	--	--	240	1	--
10...	3.4	13	170	.8	17	3	0	--	--	200	<1	--
16...	2.4	13	150	.6	16	2	100	--	--	220	<1	--
31...	4.3	15	150	.9	16	3	100	--	--	240	1	--
SEP.												
20...	4.2	16	160	1.0	16	2	100	--	--	120	1	--
27...	3.2	13	150	1.1	16	2	0	--	--	160	<1	--
OCT.												
04...	2.8	16	170	1.1	17	2	0	--	--	260	<1	--
09...	3.1	17	170	1.1	17	3	<100	--	--	290	<1	--
16...	3.3	16	170	1.0	17	2	100	--	--	200	0	--
23...	3.5	16	170	1.2	16	1	0	--	--	280	0	--
31...	3.8	15	170	1.0	18	1	100	--	--	190	0	--
NOV.												
06...	3.8	16	160	1.0	16	2	<100	--	--	250	1	--
20...	2.9	16	160	1.0	15	4	<100	--	--	230	0	--
DEC.												
04...	2.4	13	150	1.1	15	3	130	<1	<5	130	<15	<5
18...	2.9	15	170	1.0	3.4	3	100	--	--	220	0	0
31...	2.9	14	150	1.1	16	1	100	--	--	210	0	0
JAN., 1975												
15...	3.4	16	160	1.2	17	1	0	--	--	240	2	10
FEB.												
03...	2.6	19	170	1.1	16	5	100	--	--	190	0	0
19...	2.6	17	170	1.3	16	1	<100	--	--	220	--	--

09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED COBALT (CO) (UG/L) (01035)	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED TIN (SN) (UG/L) (01100)
APR., 1974												
23...	--	--	110	--	30	--	--	--	--	--	--	--
MAY												
03...	--	--	40	--	10	--	--	--	--	--	--	--
17...	--	--	40	--	100	--	--	--	--	--	--	--
22...	<15	<4	300	<16	210	6	<8	<2	1600	<8.0	10	<11
31...	--	4	30	5	140	--	--	--	--	--	30	--
JUNE												
14...	--	2	40	7	40	--	--	--	--	--	30	--
21...	--	3	20	8	180	--	--	--	--	--	40	--
26...	--	9	40	7	200	--	--	--	--	--	30	--
JULY												
02...	--	5	50	1	230	--	--	--	--	--	0	--
11...	--	1	50	4	180	--	--	--	--	--	10	--
20...	--	12	150	3	140	--	--	--	--	--	40	--
AUG.												
03...	--	2	90	4	180	--	--	--	--	--	20	--
10...	--	4	50	2	70	--	--	--	--	--	30	--
16...	--	3	50	1	40	--	--	--	--	--	10	--
31...	--	3	70	6	50	--	--	--	--	--	20	--
SEP.												
20...	--	1	30	4	50	--	--	--	--	--	20	--
27...	--	0	120	2	50	--	--	--	--	--	0	--
OCT.												
04...	--	1	30	0	100	--	--	--	--	--	20	--
09...	--	6	60	4	170	--	--	--	--	--	60	--
16...	--	0	60	3	160	--	--	--	--	--	30	--
23...	--	0	80	1	140	--	--	--	--	--	0	--
31...	--	1	40	1	230	--	--	--	--	--	30	--
NOV.												
06...	--	2	390	3	230	--	--	--	--	--	50	--
20...	--	1	10	2	110	--	--	--	--	--	10	--
DEC.												
04...	<5	1	300	<5	100	7	<4	0	1800	<3.0	<15	<5
18...	--	1	10	1	80	--	--	--	--	--	0	--
31...	--	0	10	0	50	--	--	--	--	--	10	--
JAN., 1975												
15...	--	8	20	7	60	--	--	--	--	--	40	--
FEB.												
03...	--	1	20	6	67	--	--	--	--	--	20	--
19...	--	--	60	--	--	--	--	--	--	--	--	--

09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY DAT

DATE	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L) (09511)	FECAL COLI-FORM (COL. PER 100 ML) (31616)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	0	--	--	--	--
17...	--	--	--	--	0	--	--	0	--	--	--	--
22...	60	<8	<16	10	2	<8	<24	0	--	--	--	--
31...	--	--	--	10	1	--	--	0	--	--	--	--
JUNE												
14...	--	--	--	10	1	--	--	0	--	--	--	--
21...	--	--	--	10	1	--	--	0	--	--	--	--
26...	--	--	--	10	0	--	--	0	--	--	--	--
JULY												
02...	--	--	--	0	1	--	--	0	--	--	--	--
11...	--	--	--	0	1	--	--	0	--	--	--	--
20...	--	--	--	0	0	--	--	0	--	--	--	--
AUG.												
03...	--	--	--	0	1	--	--	0	--	--	--	--
10...	--	--	--	0	2	--	--	0	--	--	--	--
16...	--	--	--	0	2	--	--	0	--	--	--	--
31...	--	--	--	0	1	--	--	0	--	--	--	--
SEP.												
20...	--	--	--	0	1	--	--	0	--	--	--	--
27...	--	--	--	0	1	--	--	0	--	--	--	--
OCT.												
04...	--	--	--	0	1	--	--	0	--	--	--	--
09...	--	--	--	0	0	--	--	0	--	--	--	--
16...	--	--	--	0	0	--	--	0	--	--	--	--
23...	--	--	--	0	0	--	--	0	--	--	--	--
31...	--	--	--	0	0	--	--	0	--	--	--	--
NOV.												
06...	--	--	--	0	0	--	--	--	--	--	--	--
20...	--	--	--	0	1	--	--	0	--	--	--	--
DEC.												
04...	450	<3	<5	8	1	25	<10	0	2.2	2.4	.04	33
18...	--	--	--	20	2	--	--	0	--	--	--	--
31...	--	--	--	20	1	--	--	0	--	--	--	--
JAN., 1975												
15...	--	--	--	20	1	--	--	0	--	--	--	--
FEB.												
03...	--	--	--	20	1	--	--	0	--	--	--	--
19...	--	--	--	--	1	--	--	--	--	--	--	--

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WATER QUALITY DA

DATE	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR-DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI-ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	TOX-APHENE (UG/L) (39400)	HEPTA-CHLOR (UG/L) (39410)	HEPTA-CHLOR EPOXIDE (UG/L) (39420)	PCB (UG/L) (39516)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
02...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
AUG.												
03...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
SEP.												
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
OCT.												
04...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
NOV.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
DEC.												
04...	.00	.00	.0	.00	.00	.00	.00	.00	0	.00	.00	.0
18...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JAN., 1975												
15...	--	--	--	--	--	--	--	--	--	--	--	--
FEB.												
03...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--

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WATER QUALITY DA

DATE	MALA-THION (UG/L) (39530)	PARA-THION (UG/L) (39540)	DI-AZINON (UG/L) (39570)	METHYL PARA-THION (UG/L) (39600)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_SOLVED AMMONIA (NH4) (MG/L) (71846)
APR., 1974												
23...	--	--	--	--	--	--	--	625	43.5	.85	--	--
MAY												
03...	--	--	--	--	--	--	--	578	53.7	.79	--	--
17...	--	--	--	--	--	--	--	701	22.7	.95	--	--
22...	--	--	--	--	--	--	--	792	14.2	1.08	--	--
31...	--	--	--	--	--	--	--	786	13.6	1.07	--	--
JUNE												
14...	--	--	--	--	--	--	--	776	14.5	1.06	--	--
21...	--	--	--	--	--	--	--	764	14.4	1.04	--	--
26...	--	--	--	--	--	--	--	783	15.4	1.06	--	--
JULY												
02...	--	--	--	--	--	--	--	809	14.1	1.10	--	--
11...	--	--	--	--	--	--	--	829	9.04	1.13	--	--
20...	--	--	--	--	--	--	--	670	26.4	.91	--	--
AUG.												
03...	--	--	--	--	--	--	--	786	17.0	1.07	--	--
10...	--	--	--	--	--	--	--	674	51.0	.92	--	--
16...	--	--	--	--	--	--	--	640	12.8	.87	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
SEP.												
20...	--	--	--	--	--	--	--	696	13.4	.95	--	--
27...	--	--	--	--	--	--	--	649	14.3	.88	--	--
OCT.												
04...	--	--	--	--	--	--	--	730	--	.99	--	--
09...	--	--	--	--	--	--	--	749	6.05	1.02	--	--
16...	--	--	--	--	--	--	--	738	8.31	1.00	--	--
23...	--	--	--	--	--	--	--	718	10.3	.98	--	--
31...	--	--	--	--	--	--	--	762	--	1.04	--	--
NOV.												
06...	--	--	--	--	--	--	--	739	12.0	1.01	--	--
20...	--	--	--	--	--	--	--	698	18.0	.95	--	--
DEC.												
04...	.00	.00	.00	.00	.00	.00	.00	664	17.6	.90	.03	.04
18...	--	--	--	--	--	--	--	715	21.2	.97	.05	.05
31...	--	--	--	--	--	--	--	697	14.8	.95	.05	.10
JAN., 1975												
15...	--	--	--	--	--	--	--	723	18.6	.98	.05	.17
FEB.												
03...	--	--	--	--	--	--	--	736	24.4	1.00	.04	.08
19...	--	--	--	--	--	--	--	761	24.2	1.04	.04	.09

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WATER QUALITY D

DATE	DIS_ SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_ SOLVED NITRITE (NO2) (MG/L) (71856)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
APR., 1974								
23...	--	--	--	6366	--	--	--	--
MAY								
03...	--	--	--	6366	--	--	--	--
17...	--	--	.0	6366	--	--	--	--
22...	--	--	.0	6366	--	--	--	--
31...	--	--	.0	6366	--	--	--	--
JUNE								
14...	--	--	.0	6366	--	--	--	--
21...	--	--	.0	6366	--	--	--	--
26...	--	--	.0	6366	--	--	--	--
JULY								
02...	--	--	.0	6366	--	--	--	--
11...	--	--	.0	6366	--	--	--	--
20...	--	--	.0	6366	--	--	--	--
AUG.								
03...	--	--	.0	6366	--	--	--	--
10...	--	--	.0	6366	--	--	--	--
16...	--	--	.0	6366	--	--	--	--
31...	--	--	.8	6366	--	--	--	--
SEP.								
20...	--	--	.0	6366	--	--	--	--
27...	--	--	.1	6366	--	--	--	--
OCT.								
04...	--	--	.0	6366	--	--	--	--
09...	--	--	.0	6366	--	--	--	--
16...	--	--	.0	6366	--	--	--	--
23...	--	--	.0	6366	--	--	--	--
31...	--	--	.0	6366	--	--	--	--
NOV.								
06...	--	--	.0	6366	--	--	--	--
20...	--	--	.0	6366	--	--	--	--
DEC.								
04...	1.7	.00	<.1	6366	9.3	3.5	1.7	1.9
18...	1.5	.07	<.1	6366	--	--	--	--
31...	1.9	.00	.0	6366	--	--	--	--
JAN., 1975								
15...	2.5	.03	.1	6366	--	--	--	--
FEB.								
03...	1.4	.03	.1	6366	--	--	--	--
19...	1.2	.03	--	6366	--	--	--	--

PROCESS DATE 06/04/75
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09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY [illegible]A

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPER-ATURE (DEG C) (00010)	WEATHER (00041)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	CHEM-ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L) (00340)	PH (UNITS) (00400)
MAR., 1975												
01...	1615	2	--	7.0	--	13	--	--	975	--	--	7.2
06...	1300	2	752600	8.0	--	7.7	20	20	1200	10.2	35	8.0
20...	1320	2	--	11.0	--	--	20	5	1100	10.3	--	8.5
APR.												
02...	1345	2	--	6.0	1	9.7	130	8	1000	10.1	--	8.5

PROCESS DATE 06/04/75
'DISTRICT CODE 08

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WATER QUALITY DATA

DATE	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	TOTAL FILT-RABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILT-RABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L) (00608)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)
MAR.. 1975												
01...	46	371	452	0	--	--	--	--	--	--	--	.04
06...	8.5	437	533	0	700	51	6	.09	.01	.22	.86	.23
20...	2.6	422	450	32	--	--	3	.03	.00	.10	.58	.10
APR.												
02...	2.7	444	541	0	--	--	3	.04	.00	.28	1.0	.28

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WATER QUALITY DATA

DATE	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	TOTAL ORGANIC CARBON (C) (MG/L) (00680)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)
MAR., 1975												
01...	.31	--	.10	--	--	--	320	0	54	45	98	2.4
06...	.18	.13	.06	8.4	.00	.2	370	0	70	48	120	2.7
20...	.09	.03	.03	--	.00	.2	370	0	66	49	120	2.7
APR.												
02...	.12	.32	.04	--	.00	.2	370	0	69	47	120	2.7

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WATER QUALITY A

DATE	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COPPER (CU) (UG/L) (01040)
MAR., 1975												
01...	38	19	24	130	.7	12	--	--	--	--	--	--
06...	41	4.9	15	140	1.1	14	2	200	220	0	0	2
20...	41	3.3	16	160	1.3	12	4	<100	220	0	0	1
APR.												
02...	41	3.6	15	160	1.3	14	2	<100	240	0	0	1

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WATER QUALITY DATA

DATE	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	FECAL COLI-FORM (COL. PER 100 ML) (31616)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)
MAR., 1975												
01...	170	--	220	--	--	--	--	--	--	--	606	21.6
06...	90	3	110	10	10	1	0	7.6	3.3	28	678	14.1
20...	10	2	110	20	20	1	0	--	--	--	683	--
APR.												
02...	20	1	70	20	20	1	0	--	--	--	699	18.3

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DISTRICT CODE 08

WATER QUALITY

DATE	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS-SOLVED AMMONIA (NH4) (MG/L) (71846)	DIS-SOLVED NITRATE (NO3) (MG/L) (71851)	DIS-SOLVED NITRITE (NO2) (MG/L) (71856)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
MAR., 1975											
01...	.82	--	--	--	--	--	6366	--	--	--	--
06...	.92	.10	.12	.97	.03	.2	6366	15	2.1	6.2	2.9
20...	.93	.03	.04	.44	.00	.0	6366	--	--	--	--
APR.											
02...	.95	.04	.05	1.2	.00	.8	6366	--	--	--	--

PROCESS DATE 06/04/75

09306022 - STEWART GULCH AB WEST FORK NR RIO BLANCO, CO.   DISTRICT CODE 08

WATER QUALITY D

DATE	TIME	TYPE	DEPTH (FT) (00003)	SAMPLE NUMBER (00008)	TEMPER-ATURE (DEG C) (00010)	WEATHER (00041)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	CHEM-ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L) (00340)
SEP., 1974												
12...	1300	2	--	--	8.5	--	2.4	--	--	1420	9.8	--
20...	1115	2	--	--	9.5	--	2.7	--	--	1400	9.0	--
27...	1015	2	--	--	8.0	--	2.3	--	--	1410	8.3	--
OCT.												
04...	1300	2	--	--	10.0	--	--	--	--	1350	11.0	--
09...	1230	2	--	--	10.5	--	2.1	--	--	1370	9.2	--
16...	1200	2	--	--	8.0	--	1.9	--	--	1360	13.8	--
23...	1130	2	--	--	9.0	--	1.8	--	--	1400	8.4	--
30...	1400	2	--	--	8.0	--	1.3	--	--	1370	7.9	--
NOV.												
06...	1130	2	--	--	8.0	--	2.1	--	--	1460	10.2	--
20...	0930	2	--	--	6.0	--	2.4	--	--	1750	10.5	--
DEC.												
04...	1100	2	.4	751800	5.0	--	2.4	30	3	1360	11.0	5
17...	0915	2	--	--	1.0	--	2.1	10	3	1300	9.0	--
30...	1315	2	--	--	6.0	--	2.0	3	3	750	14.0	--
JAN., 1975												
15...	--	2	--	--	4.5	--	2.3	8	5	1400	10.6	--
FEB.												
03...	1030	2	--	--	6.0	--	1.7	5	3	1400	10.0	--
19...	1010	2	--	--	6.0	--	1.8	30	3	1300	10.0	--
MAR.												
06...	1030	2	--	752600	9.0	--	2.0	10	20	1500	11.0	10
20...	1115	2	--	--	13.0	--	--	16	8	1300	10.4	--
APR.												
02...	1230	2	--	--	4.0	1	2.5	17	0	1000	10.2	--

WATER QUALITY [illegible]TA

DATE	PH (UNITS) (00400)	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	TOTAL FILT-RABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILT-RABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L) (00608)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)
SEP., 1974												
12...	7.9	10	427	520	--	--	--	--	--	--	--	--
20...	8.0	8.3	427	520	--	--	--	--	--	--	--	--
27...	8.1	6.5	419	511	--	--	--	--	--	--	--	--
OCT.												
04...	8.2	4.8	387	472	--	--	--	--	--	--	--	--
09...	8.5	2.5	404	492	--	--	--	--	--	--	--	--
16...	8.6	1.9	396	483	--	--	--	--	--	--	--	--
23...	7.8	13	422	514	--	--	--	--	--	--	--	--
30...	8.5	2.6	421	513	--	--	--	--	--	--	--	--
NOV.												
06...	8.2	5.4	436	531	--	--	--	--	--	--	--	--
20...	7.4	50	641	782	--	--	--	--	--	--	--	--
DEC.												
04...	8.3	3.9	403	491	0	980	1	2	.06	.00	1.7	.22
17...	8.4	3.7	472	575	0	--	--	1	.07	.00	1.7	.32
30...	8.2	5.0	405	494	0	--	--	1	.09	.00	1.8	.14
JAN., 1975												
15...	7.2	51	418	510	0	--	--	7	.03	.01	1.8	.40
FEB.												
03...	8.8	1.3	426	519	0	--	--	9	.06	.01	1.9	.45
19...	8.5	2.6	423	516	0	--	--	8	.05	.01	1.8	.65
MAR.												
06...	8.1	6.5	418	510	0	960	32	7	.03	.01	1.8	.46
20...	8.4	3.3	422	437	38	--	--	4	.03	.00	1.8	.80
APR.												
02...	8.6	2.0	408	497	0	--	--	3	.01	.00	1.8	.36

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WATER QUALITY DATA

DATE	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	TOTAL ORGANIC CARBON (C) (MG/L) (00680)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)
SEP., 1974												
12...	1.5	.03	--	.01	--	--	--	530	110	85	78	130
20...	1.5	.03	--	.01	--	--	--	570	150	95	82	120
27...	1.6	.03	--	.01	--	--	--	550	130	95	76	120
OCT.												
04...	1.5	.06	--	.02	--	--	--	460	75	73	68	130
09...	1.4	.03	--	.01	--	--	--	560	150	98	76	120
16...	1.6	.03	--	.01	--	--	--	520	130	96	69	120
23...	1.5	.00	--	.00	--	--	--	530	100	95	70	120
30...	1.6	.03	--	.01	--	--	--	550	130	99	74	120
NOV.												
06...	1.7	.09	--	.03	--	--	--	560	120	99	75	130
20...	1.6	.03	--	.01	--	--	--	490	0	89	64	250
DEC.												
04...	1.7	.03	.01	.01	--	.00	.0	560	150	99	75	120
17...	1.7	.03	.06	.01	--	.00	.2	560	85	96	77	130
30...	1.8	.15	.05	.05	--	.00	.7	530	130	97	71	120
JAN., 1975												
15...	1.8	.03	.02	.01	--	.00	.2	550	130	93	76	120
FEB.												
03...	1.9	.12	.13	.04	--	.01	.1	570	140	98	78	120
19...	1.8	.12	.07	.04	--	.02	.0	550	120	93	76	120
MAR.												
06...	1.8	.09	.14	.03	3.1	.00	.1	570	150	95	81	120
20...	1.8	.09	.05	.03	--	.00	.1	600	170	97	86	120
APR.												
02...	1.8	.06	.08	.02	--	.00	.2	540	130	95	74	120

09306022 - STEWART GULCH AB WEST FORK NR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY [illegible]A

DATE	SODIUM AD-SORP-TION RATIO (00931)	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)
SEP., 1974												
12...	2.5	35	2.5	8.1	370	.2	17	1	0	90	7	--
20...	2.2	31	2.5	7.8	370	.3	15	1	0	70	2	--
27...	2.2	32	2.1	6.4	360	.3	17	1	0	70	<1	--
OCT.												
04...	2.6	38	2.0	6.5	330	.2	16	1	0	110	0	--
09...	2.2	32	1.6	6.3	380	.2	15	1	<100	100	<1	--
16...	2.3	33	1.9	6.0	360	.2	16	1	<100	50	0	--
23...	2.3	33	1.9	6.6	350	.3	17	1	0	110	0	--
30...	2.2	32	2.3	6.1	340	.3	17	0	<100	30	0	--
NOV.												
06...	2.4	34	2.0	6.9	350	.6	16	1	<100	120	3	--
20...	4.9	53	2.4	16	330	3.3	16	4	<100	530	0	--
DEC.												
04...	2.2	32	1.1	6.5	360	.2	15	1	<100	90	1	<10
17...	2.4	34	1.4	11	340	1.2	15	2	100	260	1	<10
30...	2.3	33	2.0	7.6	370	.2	15	0	<100	80	0	0
JAN., 1975												
15...	2.2	32	1.7	6.7	380	.2	15	1	100	120	1	10
FEB.												
03...	2.2	32	1.6	7.0	370	.4	16	3	<100	70	1	0
19...	2.2	32	1.5	8.1	380	.3	15	1	<100	80	1	0
MAR.												
06...	2.2	31	1.7	7.2	370	.3	15	0	<100	80	0	0
20...	2.1	30	1.6	7.0	370	.1	14	2	<100	80	0	20
APR.												
02...	2.2	32	2.4	7.0	370	.3	15	0	<100	90	1	0

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WATER QUALITY DAT

DATE	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L) (09511)	FECAL COLI-FORM (COL. PER 100 ML) (31616)
SEP., 1974												
12...	5	50	2	0	10	0	1	0	--	--	--	--
20...	8	130	2	10	20	0	1	0	--	--	--	--
27...	1	40	2	0	10	0	1	0	--	--	--	--
OCT.												
04...	1	20	1	0	20	0	1	0	--	--	--	--
09...	0	50	2	10	40	0	1	0	--	--	--	--
16...	0	50	2	0	20	0	0	0	--	--	--	--
23...	0	20	1	0	20	0	1	0	--	--	--	--
30...	0	20	2	0	30	0	1	0	--	--	--	--
NOV.												
06...	2	620	3	20	90	0	1	0	--	--	--	--
20...	0	20	2	0	370	40	2	0	--	--	--	--
DEC.												
04...	5	10	5	20	30	<10	1	0	<2.9	<.4	.06	--
17...	1	10	1	0	20	20	1	0	--	--	--	--
30...	1	20	2	0	20	10	1	0	--	--	--	--
JAN., 1975												
15...	3	10	7	10	20	10	1	0	--	--	--	--
FEB.												
03...	8	10	6	40	20	10	1	0	--	--	--	--
19...	3	10	2	30	60	20	1	0	--	--	--	--
MAR.												
06...	2	40	0	30	20	20	1	0	<3.4	2.4	--	0
20...	1	20	3	30	30	10	1	0	--	--	--	--
APR.												
02...	3	30	2	10	20	10	1	0	--	--	--	--

09306022 - STEWART GULCH AB WEST FORK NR RIO BLANCO, CO. DISTRICT CODE 08 PROCESS DATE 06/04/75

WATER QUALITY [illegible]A

DATE	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR-DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI-ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	TOX-APHENE (UG/L) (39400)	HEPTA-CHLOR (UG/L) (39410)	HEPTA-CHLOR EPOXIDE (UG/L) (39420)	PCB (UG/L) (39516)
SEP., 1974												
12...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
OCT.												
04...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
NOV.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
DEC.												
04...	.00	.00	.0	.00	.00	.00	.00	.00	0	.00	.00	.0
17...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
JAN., 1975												
15...	--	--	--	--	--	--	--	--	--	--	--	--
FEB.												
03...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
APR.												
02...	--	--	--	--	--	--	--	--	--	--	--	--

PROCESS DATE 06/04/75

09306022 - STEWART GULC[illegible] WEST FORK NR RIO BLANCO, CO.   DISTRICT CODE 08

WATER QUALITY DATA

DATE	MALA-THION (UG/L) (39530)	PARA-THION (UG/L) (39540)	DI-AZINON (UG/L) (39570)	METHYL PARA-THION (UG/L) (39600)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_SOLVED AMMONIA (NH4) (MG/L) (71846)
SEP., 1974												
12...	--	--	--	--	--	--	--	954	6.36	1.30	--	--
20...	--	--	--	--	--	--	--	956	7.12	1.30	--	--
27...	--	--	--	--	--	--	--	936	5.99	1.27	--	--
OCT.												
04...	--	--	--	--	--	--	--	865	--	1.18	--	--
09...	--	--	--	--	--	--	--	946	5.41	1.29	--	--
16...	--	--	--	--	--	--	--	915	4.92	1.24	--	--
23...	--	--	--	--	--	--	--	921	4.55	1.25	--	--
30...	--	--	--	--	--	--	--	919	3.25	1.25	--	--
NOV.												
06...	--	--	--	--	--	--	--	950	5.39	1.29	--	--
20...	--	--	--	--	--	--	--	1160	7.70	1.58	--	--
DEC.												
04...	.00	.00	.00	.00	.00	.00	.00	927	6.01	1.26	.04	.08
17...	--	--	--	--	--	--	--	963	5.49	1.31	.03	.09
30...	--	--	--	--	--	--	--	936	5.18	1.27	.03	.12
JAN., 1975												
15...	--	--	--	--	--	--	--	953	6.12	1.30	.03	.04
FEB.												
03...	--	--	--	--	--	--	--	956	4.44	1.30	.18	.08
19...	--	--	--	--	--	--	--	957	4.86	1.30	.05	.06
MAR.												
06...	--	--	--	--	--	--	--	950	5.36	1.29	.06	.04
20...	--	--	--	--	--	--	--	958	--	1.30	.03	.04
APR.												
02...	--	--	--	--	--	--	--	937	6.43	1.27	.02	.01

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PROCESS DATE /04/75
DISTRICT CODE 08

WATER QUALITY DATA

DATE	TOTAL NITRATE (NO3) (MG/L) (71850)	DIS_ SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_ SOLVED NITRITE (NO2) (MG/L) (71856)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
SEP., 1974								
12...	--	--	--	.0	--	--	--	--
20...	--	--	--	.0	--	--	--	--
27...	--	--	--	.0	--	--	--	--
OCT.								
04...	--	--	--	.0	--	--	--	--
09...	--	--	--	.0	--	--	--	--
16...	--	--	--	.0	--	--	--	--
23...	--	--	--	.0	--	--	--	--
30...	--	--	--	.0	--	--	--	--
NOV.								
06...	--	--	--	.0	--	--	--	--
20...	--	--	--	.0	--	--	--	--
DEC.								
04...	--	7.5	.00	<.1	14	<.4	<2.3	<.4
17...	7.5	7.5	.00	<.1	--	--	--	--
30...	--	8.0	.00	.0	--	--	--	--
JAN., 1975								
15...	--	7.9	.03	.0	--	--	--	--
FEB.								
03...	--	8.4	.03	.0	--	--	--	--
19...	--	7.9	.03	.0	--	--	--	--
MAR.								
06...	--	7.9	.03	.0	13	1.7	<2.7	2.1
20...	--	8.0	.00	.0	--	--	--	--
APR.								
02...	--	8.0	.00	.1	--	--	--	--

09306025 - WEST FORK STE RT GULCH NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPERATURE (DEG C) (00010)	DISCHARGE (CFS) (00060)	INSTANTANEOUS DISCHARGE (CFS) (00061)	SPECIFIC CONDUCTANCE (MICROMHOS) (00095)	DISSOLVED OXYGEN (MG/L) (00300)	PH (UNITS) (00400)	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKALINITY AS CACO3 (MG/L) (00410)	BICARBONATE (HCO3) (MG/L) (00440)
MAY , 1974												
03...	1300	2	--	20.0	--	--	1740	7.1	8.3	4.7	482	588
17...	1000	2	--	11.0	--	.03	1620	9.8	8.0	8.9	459	559
22...	1240	2	1882	21.0	--	.06	1640	9.4	8.2	5.4	437	533
31...	1345	2	--	26.0	--	--	1630	6.6	8.2	5.6	451	550
JUNE												
14...	1230	2	--	30.0	.02	--	1570	7.4	8.4	3.2	418	499
21...	1330	2	--	30.0	--	--	1530	8.3	8.5	2.4	381	438
26...	1140	2	--	25.0	--	.02	1540	9.2	8.2	4.6	374	456
JULY												
02...	0700	2	--	10.0	--	.03	1630	8.7	8.1	6.9	445	543
11...	1415	2	--	27.0	--	.02	1580	9.2	8.3	3.7	376	459
20...	1415	2	--	26.0	--	.02	1610	8.2	8.1	6.6	426	519
AUG.												
03...	0840	2	--	12.5	--	.02	1640	8.7	8.1	6.8	436	532
10...	1005	2	--	8.0	--	.02	1730	8.2	8.2	6.1	495	603
SEP.												
12...	1200	2	--	8.0	--	.02	2010	10.1	7.4	42	545	664
27...	0945	2	--	5.0	--	.04	1610	9.4	8.3	4.3	445	542
OCT.												
03...	1210	2	--	11.0	--	--	1730	8.9	8.4	3.6	460	561
09...	1120	2	--	12.0	--	.03	1590	7.9	8.7	1.7	428	522
16...	1320	2	--	14.0	--	.07	1570	8.8	8.8	1.3	413	504
23...	1030	2	--	7.0	--	.06	1620	10.8	8.3	4.3	444	541
30...	1155	2	--	5.0	--	.15	1580	9.2	8.7	1.5	393	479
NOV.												
06...	1330	2	--	2.0	--	.13	1460	13.5	8.2	4.9	400	488
20...	1030	2	--	.0	.06	--	2070	--	--	--	621	757

PROCESS DATE 06/04/75

09306025 - WEST FORK STEW GULCH NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	CAR-BONATE (CO3) (MG/L) (00445)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)
MAY , 1974												
03...	0	.16	.03	.01	690	200	110	100	160	2.7	33	7.0
17...	0	.08	.06	.02	660	200	100	100	160	2.7	34	2.8
22...	0	.02	.06	.02	650	210	95	100	160	2.7	35	2.7
31...	0	.04	.12	.04	650	200	96	99	150	2.6	33	2.6
JUNE												
14...	5	.03	.00	.00	610	190	88	95	150	2.6	35	2.7
21...	13	.03	.03	.01	580	200	79	94	150	2.7	36	1.9
26...	0	.01	.06	.02	620	250	88	97	150	2.6	34	2.1
JULY												
02...	0	.03	.06	.02	700	250	98	110	150	2.5	32	1.2
11...	0	.25	.12	.04	610	230	78	100	160	2.8	36	1.5
20...	0	.03	.09	.03	640	220	92	100	170	2.9	36	2.4
AUG.												
03...	0	.02	.06	.02	650	220	96	100	150	2.6	33	1.5
10...	0	.37	.09	.03	700	200	97	110	160	2.6	33	3.8
SEP.												
12...	--	.01	.00	.00	740	200	100	120	220	3.5	39	9.8
27...	--	.08	.03	.01	660	210	98	100	150	2.5	33	4.2
OCT.												
03...	--	.02	.03	.01	590	130	77	96	180	3.2	40	6.4
09...	--	.02	.03	.01	580	150	77	94	150	2.7	36	1.9
16...	--	.02	.00	.00	610	190	94	90	150	2.7	35	4.1
23...	--	.01	.00	.00	620	180	100	91	160	2.8	36	4.6
30...	--	.08	.03	.01	530	140	48	100	160	3.0	39	4.9
NOV.												
06...	--	.12	.06	.02	550	150	82	84	130	2.4	34	3.1
20...	--	.66	.06	.02	820	200	130	120	200	3.0	35	3.7

09306025 - WEST FORK STEWART GULCH NEAR RIO BLANCO, CO.

WATER QUALITY [illegible]A

DATE	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COBALT (CO) (UG/L) (01035)
MAY , 1974												
03...	10	540	.2	14	--	--	--	--	--	--	--	--
17...	8.8	520	.3	10	0	--	--	--	--	--	--	--
22...	8.6	510	.1	8.9	1	60	<7	<15	90	0	<10	<20
31...	10	490	1.2	12	2	100	--	--	130	1	--	--
JUNE												
14...	9.1	470	.2	15	3	200	--	--	130	1	--	--
21...	8.5	480	.0	15	2	0	--	--	130	1	--	--
26...	7.6	470	.2	15	1	<100	--	--	100	2	--	--
JULY												
02...	8.2	470	.1	16	3	<100	--	--	90	0	--	--
11...	8.8	540	.2	16	3	<100	--	--	120	2	--	--
20...	10	510	.2	17	0	0	--	--	160	1	--	--
AUG.												
03...	8.6	530	.2	17	1	0	--	--	110	1	--	--
10...	12	540	.2	18	1	0	--	--	120	2	--	--
SEP.												
12...	29	580	.1	17	2	0	--	--	150	<1	--	--
27...	9.7	480	.2	17	1	0	--	--	80	2	--	--
OCT.												
03...	19	480	.2	14	2	0	--	--	150	0	--	--
09...	11	430	.2	14	1	0	--	--	110	<1	--	--
16...	10	480	.2	13	1	<100	--	--	80	0	--	--
23...	11	470	.2	14	1	0	--	--	130	0	--	--
30...	12	450	.2	14	0	<100	--	--	40	0	--	--
NOV.												
06...	9.4	380	.2	13	1	<100	--	--	90	1	--	--
20...	12	590	.2	17	2	<100	--	--	130	1	--	--

PROCESS DATE 06/04/75

09306025 - WEST FORK STEWART GULCH NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED TIN (SN) (UG/L) (01100)	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)
MAY , 1974												
03...	--	40	--	0	--	--	--	--	--	--	--	--
17...	--	30	--	20	--	--	--	--	--	--	--	--
22...	<5	50	<20	0	<7	<10	<3	3200	<10	<10	<15	40
31...	4	50	6	10	--	--	--	--	--	20	--	--
JUNE												
14...	6	20	10	0	--	--	--	--	--	20	--	--
21...	2	30	2	0	--	--	--	--	--	20	--	--
26...	3	50	4	10	--	--	--	--	--	10	--	--
JULY												
02...	4	40	0	0	--	--	--	--	--	30	--	--
11...	2	20	7	10	--	--	--	--	--	10	--	--
20...	8	50	4	20	--	--	--	--	--	10	--	--
AUG.												
03...	2	190	6	0	--	--	--	--	--	20	--	--
10...	6	80	2	10	--	--	--	--	--	30	--	--
SEP.												
12...	8	120	2	0	--	--	--	--	--	10	--	--
27...	1	60	2	0	--	--	--	--	--	10	--	--
OCT.												
03...	6	40	1	0	--	--	--	--	--	20	--	--
09...	2	60	3	0	--	--	--	--	--	40	--	--
16...	0	20	3	0	--	--	--	--	--	20	--	--
23...	0	20	0	10	--	--	--	--	--	10	--	--
30...	0	30	1	0	--	--	--	--	--	20	--	--
NOV.												
06...	1	210	3	0	--	--	--	--	--	40	--	--
20...	1	20	11	10	--	--	--	--	--	20	--	--

PROCESS DAT[illegible]6/04/75

09306025 - WEST FORK STE[illegible]RT GULCH NEAR RIO BLANCO, CO.

DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)
MAY , 1974												
03...	--	--	--	--	--	--	0	1230	--	1.67	--	6668
17...	--	--	--	0	--	--	0	1180	.10	1.60	.0	6668
22...	<10	<20	10	0	<10	<30	0	1150	.19	1.56	.0	6668
31...	--	--	10	0	--	--	0	1130	--	1.54	.0	6668
JUNE												
14...	--	--	10	1	--	--	0	1080	.06	1.47	.0	6668
21...	--	--	20	1	--	--	0	1060	--	1.44	.0	6668
26...	--	--	10	1	--	--	0	1060	.06	1.44	.9	6668
JULY												
02...	--	--	0	0	--	--	0	1120	.09	1.52	.0	6668
11...	--	--	0	0	--	--	0	1130	.06	1.54	.0	6668
20...	--	--	10	1	--	--	0	1160	.06	1.58	.0	6668
AUG.												
03...	--	--	0	0	--	--	0	1170	.06	1.59	.0	6668
10...	--	--	0	1	--	--	0	1240	.07	1.69	.0	6668
SEP.												
12...	--	--	0	1	--	--	0	1400	.08	1.90	.0	6668
27...	--	--	0	0	--	--	0	1130	.12	1.54	.0	6668
OCT.												
03...	--	--	0	0	--	--	0	1150	--	1.56	.0	6668
09...	--	--	0	0	--	--	0	1040	.08	1.41	.0	6668
16...	--	--	0	0	--	--	0	1090	.21	1.48	.0	6668
23...	--	--	0	0	--	--	0	1120	.18	1.52	.0	6668
30...	--	--	0	0	--	--	0	1030	.42	1.40	.0	6668
NOV.												
06...	--	--	0	5	--	--	0	943	.33	1.28	.0	6668
20...	--	--	0	0	--	--	--	1450	.23	1.97	.0	6668

PROCESS DATE 06/04/75
DISTRICT CODE 08

09306030 - STEWART GULCH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COBALT (CO) (UG/L) (01035)
DEC., 1974										
04...	1100	2	751700	60	<2	<6	35	<20	<6	<6

PROCESS DATE 06/04/75
DISTRICT CODE 08

09306030 - STEWART GULCH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)
DEC., 1974									
04...	2	13	<6	<4	<2	<4	0	3200	<3.0

09306030 - STEWART GULCH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED TIN (SN) (UG/L) (01100)	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)
DEC., 1974									
04...	<20	<6	20	<3	<6	5	<4	<13	6392

09306039 - COTTONWOOD GU NEAR RIO BLANCO, CO.

PROCESS DATE 06/04/75
DISTRICT CODE 08

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPER-ATURE (DEG C) (00010)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	PH (UNITS) (00400)	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)
DEC., 1974												
05...	1045	2	751800	5.0	.38	200	20	1220	10.0	8.5	2.5	402

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DISTRICT CODE 08

09306039 - COTTONWOOD [illegible]CH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	TOTAL FILT-RABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILT-RABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L) (00608)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)
DEC.. 1974												
05...	449	20	820	520	0	.18	.01	.22	.50	.23	.06	.98

09306039 - COTTONWOOD GULCH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)
DEC., 1974												
05...	.02	.00	.2	270	0	50	34	200	5.3	62	1.3	30

PROCESS DATE 06/04/75

09306039 - COTTONWOOD GULCH [illegible]AR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COBALT (CO) (UG/L) (01035)	DIS-SOLVED COPPER (CU) (UG/L) (01040)
DEC., 1974												
05...	230	5.2	17	7	180	<2	<6	150	<20	<6	<6	3

PROCESS DATE 06/04/75

09306039 - COTTONWOOD GULC EAR RIO BLANCO, CO.
DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	DIS-SOLVED TIN (SN) (UG/L) (01100)	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)
DEC., 1974												
05...	140	<6	5	10	<4	0	3300	<3.0	<20	<6	140	<3

PROCESS DATE 06/04/75
DISTRICT CODE 08

09306039 - COTTONWOOD GULCH NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L) (09511)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR-DANE (UG/L) (39350)
DEC., 1974												
05...	<6	20	4	6	<11	0	4.1	27	.09	.00	.00	.0

09306039 - COTTONWOOD GUL NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI-ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	TOX-APHENE (UG/L) (39400)	HEPTA-CHLOR (UG/L) (39410)	HEPTA-CHLOR EPOXIDE (UG/L) (39420)	PCB (UG/L) (39516)	MALA-THION (UG/L) (39530)	PARA-THION (UG/L) (39540)	DI-AZINON (UG/L) (39570)
DEC., 1974												
05...	.00	.00	.00	.00	.00	0	.00	.00	.0	.00	.00	.00

09306039 - COTTONWOOD GU[illegible] NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	METHYL PARA-THION (UG/L) (39600)	2.4-D (UG/L) (39730)	2.4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_ SOLVED AMMONIA (NH4) (MG/L) (71846)	DIS_ SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_ SOLVED NITRITE (NO2) (MG/L) (71856)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)
DEC.. 1974												
05...	.00	.00	.00	.00	814	.84	1.11	.80	.23	.97	.03	<.1

PROCESS DATE 06/04/75
DISTRICT CODE 08

09306050 - SCANDARD GULCH AR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	TIME	TYPE	TEMPER-ATURE (DEG C) (00010)	DIS-CHARGE (CFS) (00060)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	PH (UNITS) (00400)	CARBON DIOXIDE (CO2) (MG/L) (00405)
JUNE, 1974											
21...	1500	2	21.0	.82	--	--	--	1420	--	8.4	3.4
MAR., 1975											
05...	1345	2	4.5	--	.07	1100	200	220	10.3	--	--

09306039 - COTTONWOOD GULCH NEAR RIO BLANCO, CO.

PROCESS DATE 06/04/75
DISTRICT CODE 08

WATER QUALITY DATA

DATE	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
DEC., 1974					
05...	6353	24	18	3.3	23

09306050 - SCANDARD GUL NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)
JUNE, 1974											
21...	441	444	46	--	--	--	--	.10	.03	--	.01
MAR., 1975											
05...	133	162	0	4	.09	.19	15	.28	.92	.37	.30

09306050 - SCANDARD GU[illegible] NEAR RIO BLANCO, CO.

PROCESS DATE 06/04/75
DISTRICT CODE 08

WATER QUALITY DATA

DATE	CYANIDE (CN) (MG/L) (00720)	HARDNESS (CA,MG) (MG/L) (00900)	NON-CARBONATE HARDNESS (MG/L) (00902)	DISSOLVED CALCIUM (CA) (MG/L) (00915)	DISSOLVED MAGNESIUM (MG) (MG/L) (00925)	DISSOLVED SODIUM (NA) (MG/L) (00930)	SODIUM ADSORPTION RATIO (00931)	PERCENT SODIUM (00932)	DISSOLVED POTASSIUM (K) (MG/L) (00935)	DISSOLVED CHLORIDE (CL) (MG/L) (00940)	DISSOLVED SULFATE (SO4) (MG/L) (00945)
JUNE, 1974											
21...	--	550	110	91	79	140	2.6	35	2.2	10	350
MAR., 1975											
05...	.00	76	0	23	4.4	42	2.1	--	--	3.2	10

PROCESS DATE 06/04/75
DISTRICT CODE 08

09306050 - SCANDARD GULCH [illegible]AR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)
JUNE, 1974											
21...	.3	13	4	0	140	2	4	20	6	20	20
MAR., 1975											
05...	2.4	8.4	--	--	110	--	--	--	--	--	--

PROCESS DATE 06/04/75

09306050 - SCANDARD GUL NEAR RIO BLANCO, CO.

DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_SOLVED NITRITE (NO2) (MG/L) (71856)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)
JUNE, 1974											
21...	10	2	--	951	2.11	1.29	--	--	--	.0	6646
MAR., 1975											
05...	--	--	0	176	.03	.24	.32	.84	.30	--	6646

PROCESS DATE 06/04/75

09306052 - SCANDARD GULC T MOUTH, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	TIME	TYPE	TEMPER-ATURE (DEG C) (00010)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)
MAR., 1975										
05...	--	2	1.5	902	--	--	300	11.9	--	--
05...	1515	2	1.5	.02	960	200	300	--	169	206

PROCESS DATE 06/04/75

09306052 - SCANDARD GULCH AT MOUTH, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	CAR-BONATE (CO3) (MG/L) (00445)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	CYANIDE (CN) (MG/L) (00720)
MAR., 1975										
05...	--	--	--	--	--	--	--	--	--	--
05...	0	5	.07	.13	23	.20	1.5	1.8	.50	.00

PROCESS DATE 06/04/75

09306052 - SCANDARD GULCH AT MOUTH, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD- SORP- TION RATIO (00931)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)
MAR., 1975										
05...	--	--	--	--	--	--	--	--	--	--
05...	78	0	23	5.0	55	2.7	13	11	3.5	8.3

09306052 - SCANDARD GULC MOUTH, NEAR RIO BLANCO, CO. DISTRICT CODE 08 PROCESS DATE /04/75

WATER QUALITY DATA

DATE	DIS-SOLVED BORON (B) (UG/L) (01020)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_SOLVED NITRITE (NO2) (MG/L) (71856)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)
MAR., 1975									
05...	--	0	--	--	--	--	--	--	6434
05...	170	--	223	.01	.30	.52	.58	.23	6434

09306058 - WILLOW CREEK NE[illegible] RIO BLANCO, CO.

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPER-ATURE (DEG C) (00010)	DIS-CHARGE (CFS) (00060)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	CHEM-ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L) (00340)	PH (UNITS) (00400)
APR., 1974												
23...	1715	2	--	12.0	--	1.0	--	--	1590	--	--	8.2
MAY												
03...	1545	2	--	17.0	--	1.6	--	--	1560	8.0	--	8.2
17...	1245	2	--	10.0	--	1.1	--	--	1390	10.5	--	7.9
22...	1410	2	1883	17.0	--	1.0	--	--	1400	10.8	--	7.9
31...	1445	2	--	18.0	--	1.1	--	--	1350	8.6	--	8.0
JUNE												
14...	1500	2	--	18.0	.67	--	--	--	1380	9.2	--	8.0
26...	1600	2	--	18.5	.99	.99	--	--	1410	11.8	--	8.0
JULY												
02...	1045	2	--	14.0	--	.79	--	--	1390	12.6	--	8.0
11...	1200	2	--	16.5	--	1.3	--	--	1410	11.4	--	7.9
20...	1315	2	--	17.5	--	.94	--	--	1330	11.6	--	7.8
AUG.												
03...	1045	2	--	10.5	--	1.8	--	--	1400	10.0	--	7.9
10...	1415	2	--	13.0	--	1.8	--	--	1390	8.9	--	7.9
SEP.												
12...	1530	2	--	13.0	--	1.1	--	--	1390	10.0	--	7.9
27...	1245	2	--	11.0	--	.57	--	--	1400	10.2	--	8.1
OCT.												
04...	1420	2	--	11.5	--	--	--	--	1370	10.0	--	8.3
09...	1500	2	--	14.0	--	.56	--	--	1390	10.0	--	8.5
17...	1100	2	--	8.0	--	.58	--	--	1380	9.6	--	8.6
23...	1400	2	--	11.0	--	.77	--	--	1400	9.8	--	8.0
31...	1100	2	--	6.5	--	--	--	--	1440	9.1	--	--
NOV.												
06...	1430	2	--	9.0	--	.93	--	--	1460	9.1	--	8.1
20...	1245	2	--	8.5	--	1.4	--	--	1470	11.5	--	8.1
DEC.												
06...	1045	2	751800	4.0	--	3.3	70	5	--	9.2	35	8.2
17...	1200	2	--	3.7	--	2.8	30	3	1500	9.5	--	8.7
JAN., 1975												
03...	1000	2	--	.0	--	2.4	9	3	1200	12.0	--	8.0
16...	--	2	--	3.5	--	2.5	40	5	1350	11.0	--	8.1
FEB.												
03...	1300	2	--	3.5	--	--	30	0	1500	10.8	--	7.5
19...	1330	2	--	5.0	--	--	200	5	1300	9.4	--	7.9
MAR.												
06...	1215	2	--	7.0	--	4.1	100	20	1250	--	38	8.2
06...	1230	2	752600	--	--	--	--	--	--	9.2	--	--

PROCESS DATE 06/04/75
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	TOTAL FILT-RABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILT-RABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L) (00608)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)
APR., 1974												
23...	5.8	468	570	0	--	--	--	--	--	--	--	.52
MAY												
03...	5.6	457	557	0	--	--	--	--	--	--	--	2.0
17...	10	425	518	0	--	--	--	--	--	--	--	.63
22...	10	414	505	0	--	--	--	--	--	--	--	.46
31...	8.0	412	502	0	--	--	--	--	--	--	--	.19
JUNE												
14...	8.3	426	519	0	--	--	--	--	--	--	--	.34
26...	7.7	395	482	0	--	--	--	--	--	--	--	.29
JULY												
02...	8.1	415	506	0	--	--	--	--	--	--	--	.23
11...	10	422	515	0	--	--	--	--	--	--	--	.46
20...	13	408	498	0	--	--	--	--	--	--	--	.35
AUG.												
03...	11	434	529	0	--	--	--	--	--	--	--	.27
10...	11	429	523	0	--	--	--	--	--	--	--	.28
SEP.												
12...	11	436	513	9	--	--	--	--	--	--	--	.39
27...	6.5	421	513	--	--	--	--	--	--	--	--	.43
OCT.												
04...	4.0	409	499	--	--	--	--	--	--	--	--	.42
09...	2.6	419	511	--	--	--	--	--	--	--	--	.94
17...	2.0	417	509	--	--	--	--	--	--	--	--	.54
23...	8.2	419	511	--	--	--	--	--	--	--	--	.48
31...	--	450	549	--	--	--	--	--	--	--	--	.48
NOV.												
06...	7.0	449	548	--	--	--	--	--	--	--	--	.29
20...	7.4	476	580	--	--	--	--	--	--	--	--	.80
DEC.												
06...	5.4	437	533	0	980	190	4	.07	.00	.40	.39	.40
17...	1.7	438	534	0	--	--	1	.05	.00	.41	.20	.41
JAN., 1975												
03...	8.4	428	522	0	--	--	7	.03	.00	.40	.25	.40
16...	6.5	419	511	0	--	--	6	.02	.01	.60	.48	.61
FEB.												
03...	27	436	531	0	--	--	5	.08	.00	.43	1.0	.43
19...	11	440	536	0	--	--	7	.03	.00	.35	1.1	.35
MAR.												
06...	5.4	440	537	0	--	--	4	.08	.01	.38	1.2	.39
06...	--	--	--	--	830	440	--	--	--	--	--	--

09306058 - WILLOW CREEK NE[illegible] RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	TOTAL ORGANIC CARBON (C) (MG/L) (00680)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)
APR., 1974												
23...	.12	--	.04	--	--	--	590	120	100	83	150	2.7
MAY												
03...	.09	--	.03	--	--	--	610	150	100	87	140	2.5
17...	.09	--	.03	--	--	--	570	150	98	80	130	2.4
22...	.09	--	.03	--	--	--	570	150	95	80	130	2.4
31...	.12	--	.04	--	--	--	560	140	94	78	130	2.4
JUNE												
14...	.06	--	.02	--	--	--	570	140	96	80	130	2.4
26...	.03	--	.01	--	--	--	560	160	92	80	140	2.6
JULY												
02...	.00	--	.00	--	--	--	540	130	94	75	130	2.4
11...	.12	--	.04	--	--	--	570	140	95	80	130	2.4
20...	.03	--	.01	--	--	--	540	130	91	75	130	2.4
AUG.												
03...	.03	--	.01	--	--	--	560	130	99	76	130	2.4
10...	.00	--	.00	--	--	--	560	140	99	77	180	3.3
SEP.												
12...	.03	--	.01	--	--	--	550	120	98	75	130	2.4
27...	.03	--	.01	--	--	--	550	130	96	75	130	2.4
OCT.												
04...	.09	--	.03	--	--	--	460	51	64	73	130	2.6
09...	.09	--	.03	--	--	--	490	74	72	76	140	2.7
17...	.03	--	.01	--	--	--	540	130	99	72	120	2.2
23...	.03	--	.01	--	--	--	490	69	80	70	130	2.6
31...	.03	--	.01	--	--	--	560	110	100	76	130	2.4
NOV.												
06...	.03	--	.01	--	--	--	570	120	100	77	130	2.4
20...	.03	--	.01	--	--	--	540	68	99	72	140	2.6
DEC.												
06...	.09	.65	.03	--	.00	.2	560	120	100	74	120	2.2
17...	.03	.09	.01	--	.01	.5	580	140	100	79	120	2.2
JAN., 1975												
03...	.03	.04	.01	--	.00	.1	550	120	95	76	120	2.2
16...	.06	.08	.02	--	.00	.1	530	110	97	70	120	2.3
FEB.												
03...	.15	.05	.05	--	.00	.1	550	120	100	74	120	2.2
19...	.03	.24	.01	--	.00	.1	540	100	96	74	110	2.1
MAR.												
06...	.09	.38	.03	16	.00	.3	540	100	94	75	110	2.1
06...	--	--	--	--	--	--	--	--	--	--	--	--

09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)
APR.. 1974												
23...	35	5.0	14	450	.5	16	--	--	--	--	--	--
MAY												
03...	33	4.2	12	440	.5	17	--	--	--	--	--	--
17...	33	2.0	9.9	380	.3	17	1	--	--	--	--	--
22...	33	1.8	10	380	.3	16	1	55	<6	<13	120	0
31...	34	1.7	13	370	1.3	16	2	0	--	--	130	1
JUNE												
14...	33	2.3	10	340	.4	17	1	200	--	--	140	0
25...	35	3.8	9.8	360	.4	16	1	<100	--	--	120	6
JULY												
02...	34	1.7	11	360	.3	15	3	<100	--	--	120	0
11...	33	2.2	12	380	.3	17	2	<100	--	--	130	2
20...	34	2.2	12	360	.3	16	0	0	--	--	60	1
AUG.												
03...	33	2.0	11	360	.3	15	1	0	--	--	130	1
10...	41	2.2	11	500	.3	18	1	0	--	--	130	1
SEP.												
12...	34	1.6	12	320	.4	18	1	0	--	--	130	<1
27...	34	2.6	10	360	.4	18	1	0	--	--	110	<1
OCT.												
04...	38	2.3	10	330	.4	17	1	0	--	--	70	0
09...	38	1.1	11	350	.4	18	2	0	--	--	140	<1
17...	32	2.3	9.9	340	.4	17	1	<100	--	--	90	0
23...	37	2.5	10	330	.5	18	1	0	--	--	160	0
31...	33	2.9	11	340	.4	15	1	<100	--	--	80	0
NOV.												
06...	33	2.3	10	350	.2	8.2	0	<100	--	--	150	1
20...	36	2.6	11	350	.4	17	2	<100	--	--	70	0
DEC.												
06...	32	1.8	11	330	.3	16	1	95	<2	<6	66	<20
17...	31	1.5	11	330	.4	16	1	<100	--	--	120	1
JAN.. 1975												
03...	32	1.7	10	330	.4	15	0	<100	--	--	110	0
16...	33	2.0	9.3	320	.4	16	1	0	--	--	120	0
FEB.												
03...	32	2.3	12	350	.3	17	4	100	--	--	110	1
19...	30	1.8	11	340	.4	15	0	100	--	--	130	1
MAR.												
06...	30	3.8	9.9	320	.4	14	0	100	--	--	100	0
06...	--	--	--	--	--	--	--	--	--	--	--	--

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WATER QUALITY DATA

DATE	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COBALT (CO) (UG/L) (01035)	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)
APR., 1974												
23...	--	--	--	150	--	30	--	--	--	--	--	--
MAY												
03...	--	--	--	40	--	20	--	--	--	--	--	--
17...	--	--	--	20	--	40	--	--	--	--	--	--
22...	<9	<20	<4	20	<20	20	<6	<9	<2	3000	<9.0	8
31...	--	--	2	30	3	10	--	--	--	--	--	30
JUNE												
14...	--	--	2	90	8	0	--	--	--	--	--	30
26...	--	--	17	40	4	20	--	--	--	--	--	20
JULY												
02...	--	--	1	20	3	0	--	--	--	--	--	30
11...	--	--	9	20	5	20	--	--	--	--	--	10
20...	--	--	8	60	3	50	--	--	--	--	--	30
AUG.												
03...	--	--	6	40	2	20	--	--	--	--	--	40
10...	--	--	5	20	3	20	--	--	--	--	--	20
SEP.												
12...	--	--	3	40	2	0	--	--	--	--	--	0
27...	--	--	1	50	2	0	--	--	--	--	--	10
OCT.												
04...	--	--	2	20	1	0	--	--	--	--	--	10
09...	--	--	2	40	7	0	--	--	--	--	--	10
17...	--	--	0	20	3	0	--	--	--	--	--	30
23...	--	--	0	40	3	10	--	--	--	--	--	10
31...	--	--	0	20	1	0	--	--	--	--	--	20
NOV.												
06...	--	--	2	320	5	10	--	--	--	--	--	10
20...	--	--	1	30	1	20	--	--	--	--	--	20
DEC.												
06...	<6	<6	3	300	<6	70	3	<4	0	3500	<3.0	20
17...	<10	--	0	10	1	0	--	--	--	--	--	10
JAN., 1975												
03...	0	--	0	0	1	20	--	--	--	--	--	20
16...	10	--	2	40	3	10	--	--	--	--	--	20
FEB.												
03...	0	--	4	10	2	30	--	--	--	--	--	30
19...	10	--	4	20	2	20	--	--	--	--	--	50
MAR.												
06...	0	--	1	50	2	50	--	--	--	--	--	30
06...	--	--	--	--	--	--	--	--	--	--	--	--

09306058 - WILLOW CREEK NEAR O BLANCO, CO.

WATER QUALITY DATA

DATE	DIS_ SOLVED AMMONIA (NH4) (MG/L) (71846)	DIS_ SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_ SOLVED NITRITE (NO2) (MG/L) (71856)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
APR., 1974									
23...	--	--	--	--	6273	--	--	--	--
MAY									
03...	--	--	--	--	6273	--	--	--	--
17...	--	--	--	.0	6273	--	--	--	--
22...	--	--	--	.0	6273	--	--	--	--
31...	--	--	--	.0	6273	--	--	--	--
JUNE									
14...	--	--	--	.0	6273	--	--	--	--
26...	--	--	--	.1	6273	--	--	--	--
JULY									
02...	--	--	--	.0	6273	--	--	--	--
11...	--	--	--	.0	6273	--	--	--	--
20...	--	--	--	.0	6273	--	--	--	--
AUG.									
03...	--	--	--	.0	6273	--	--	--	--
10...	--	--	--	.0	6273	--	--	--	--
SEP.									
12...	--	--	--	.2	6273	--	--	--	--
27...	--	--	--	.0	6273	--	--	--	--
OCT.									
04...	--	--	--	.0	6273	--	--	--	--
09...	--	--	--	.0	6273	--	--	--	--
17...	--	--	--	.0	6273	--	--	--	--
23...	--	--	--	.0	6273	--	--	--	--
31...	--	--	--	.0	6273	--	--	--	--
NOV.									
06...	--	--	--	.0	6273	--	--	--	--
20...	--	--	--	.0	6273	--	--	--	--
DEC.									
06...	.09	1.8	.00	<.1	6273	<11	12	<2.4	6.2
17...	.06	1.8	.00	<.1	6273	--	--	--	--
JAN., 1975									
03...	.04	1.8	.00	.2	6273	--	--	--	--
16...	.03	2.7	.03	.0	6273	--	--	--	--
FEB.									
03...	.10	1.9	.00	.2	6273	--	--	--	--
19...	.04	1.6	.00	.0	6273	--	--	--	--
MAR.									
06...	.10	1.7	.03	.0	6273	--	--	--	--
06...	--	--	--	--	6273	22	26	<2.7	17

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WATER QUALITY DATA

DATE	DIS-SOLVED TIN (SN) (UG/L) (01100)	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L) (09511)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	0	--	--	--
17...	--	--	--	--	--	1	--	--	0	--	--	--
22...	<13	50	<9	<20	8	1	<9	<30	0	--	--	--
31...	--	--	--	--	10	1	--	--	0	--	--	--
JUNE												
14...	--	--	--	--	10	1	--	--	0	--	--	--
26...	--	--	--	--	10	1	--	--	0	--	--	--
JULY												
02...	--	--	--	--	0	1	--	--	0	--	--	--
11...	--	--	--	--	0	2	--	--	0	--	--	--
20...	--	--	--	--	0	1	--	--	0	--	--	--
AUG.												
03...	--	--	--	--	0	2	--	--	0	--	--	--
10...	--	--	--	--	0	0	--	--	0	--	--	--
SEP.												
12...	--	--	--	--	0	1	--	--	0	--	--	--
27...	--	--	--	--	0	2	--	--	0	--	--	--
OCT.												
04...	--	--	--	--	0	1	--	--	0	--	--	--
09...	--	--	--	--	0	1	--	--	0	--	--	--
17...	--	--	--	--	0	1	--	--	0	--	--	--
23...	--	--	--	--	0	1	--	--	0	--	--	--
31...	--	--	--	--	0	0	--	--	0	--	--	--
NOV.												
06...	--	--	--	--	0	1	--	--	0	--	--	--
20...	--	--	--	--	0	1	--	--	0	--	--	--
DEC.												
06...	<6	320	<3	<6	5	1	10	<13	0	<3.0	7.7	.04
17...	--	--	--	--	10	1	--	--	0	--	--	--
JAN., 1975												
03...	--	--	--	--	10	2	--	--	0	--	--	--
16...	--	--	--	--	10	1	--	--	0	--	--	--
FEB.												
03...	--	--	--	--	0	1	--	--	0	--	--	--
19...	--	--	--	--	10	0	--	--	0	--	--	--
MAR.												
06...	--	--	--	--	10	1	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	0	<3.5	21	--

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WATER QUALITY DATA

DATE	FECAL COLI-FORM (COL. PER 100 ML) (31616)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR-DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI-ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	TOX-APHENE (UG/L) (39400)	HEPTA-CHLOR (UG/L) (39410)	HEPTA-CHLOR EPOXIDE (UG/L) (39420)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
14...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
02...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
AUG.												
03...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
SEP.												
12...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
OCT.												
04...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
NOV.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
DEC.												
06...	8	.00	.00	.0	.00	.00	.00	.00	.00	0	.00	.00
17...	--	--	--	--	--	--	--	--	--	--	--	--
JAN., 1975												
03...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB.												
03...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
06...	5	--	--	--	--	--	--	--	--	--	--	--

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WATER QUALITY DATA

DATE	PCB (UG/L) (39516)	MALA-THION (UG/L) (39530)	PARA-THION (UG/L) (39540)	DI-AZINON (UG/L) (39570)	METHYL PARA-THION (UG/L) (39600)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)
APR., 1974												
23...	--	--	--	--	--	--	--	--	1100	3.24	1.50	--
MAY												
03...	--	--	--	--	--	--	--	--	1080	4.87	1.47	--
17...	--	--	--	--	--	--	--	--	976	2.90	1.33	--
22...	--	--	--	--	--	--	--	--	964	2.81	1.31	--
31...	--	--	--	--	--	--	--	--	953	2.91	1.30	--
JUNE												
14...	--	--	--	--	--	--	--	--	933	1.69	1.27	--
26...	--	--	--	--	--	--	--	--	941	2.52	1.28	--
JULY												
02...	--	--	--	--	--	--	--	--	938	2.00	1.28	--
11...	--	--	--	--	--	--	--	--	973	3.49	1.32	--
20...	--	--	--	--	--	--	--	--	934	2.37	1.27	--
AUG.												
03...	--	--	--	--	--	--	--	--	956	4.65	1.30	--
10...	--	--	--	--	--	--	--	--	1150	5.65	1.56	--
SEP.												
12...	--	--	--	--	--	--	--	--	919	2.83	1.25	--
27...	--	--	--	--	--	--	--	--	947	1.46	1.29	--
OCT.												
04...	--	--	--	--	--	--	--	--	875	--	1.19	--
09...	--	--	--	--	--	--	--	--	925	1.40	1.26	--
17...	--	--	--	--	--	--	--	--	914	1.43	1.24	--
23...	--	--	--	--	--	--	--	--	895	1.86	1.22	--
31...	--	--	--	--	--	--	--	--	948	--	1.29	--
NOV.												
06...	--	--	--	--	--	--	--	--	950	2.39	1.29	--
20...	--	--	--	--	--	--	--	--	982	3.92	1.34	--
DEC.												
06...	.0	.00	.00	.00	.00	.00	.00	.00	922	8.34	1.25	.52
17...	--	--	--	--	--	--	--	--	924	7.19	1.26	.03
JAN., 1975												
03...	--	--	--	--	--	--	--	--	908	5.91	1.23	.04
16...	--	--	--	--	--	--	--	--	890	6.06	1.21	.04
FEB.												
03...	--	--	--	--	--	--	--	--	940	--	1.28	.00
19...	--	--	--	--	--	--	--	--	915	--	1.24	.07
MAR.												
06...	--	--	--	--	--	--	--	--	894	10.1	1.22	.10
06...	--	--	--	--	--	--	--	--	--	--	--	--

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09306058 - WILLOW CREEK R RIO BLANCO, CO.

WATER QUALITY DATA

DATE	TIME	TYPE	TEMPER-ATURE (DEG C) (00010)	WEATHER (00041)	INSTAN-TANEOUS DIS-CHARGE (CFS) (00061)	TUR-BID-ITY (JTU) (00070)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	PH (UNITS) (00400)	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)
MAR., 1975												
20...	1400	2	11.5	--	--	55	5	1300	7.7	8.2	5.0	407
APR.												
03...	1400	2	9.0	2	2.8	40	3	1300	8.2	8.2	5.1	417
15...	1200	2	12.0	1	3.4	33	3	1300	9.2	8.3	3.9	397

09306058 - WILLOW CREEK AR RIO BLANCO, CO.

WATER QUALITY DATA

DATE	BICAR- BONATE (HCO3) (MG/L) (00440)	CAR- BONATE (CO3) (MG/L) (00445)	OIL AND GREASE (MG/L) (00550)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)	DIS- SOLVED NITRITE (N) (MG/L) (00613)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L) (00625)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	PHOS- PHATE (PO4) (MG/L) (00650)	DIS- SOLVED ORTHO PHOS- PHATE (PO4) (MG/L) (00660)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (00671)
MAR., 1975												
20...	496	0	3	.02	.00	.39	.73	.39	--	.12	.19	.04
APR.												
03...	509	0	5	.01	.00	.32	.99	.32	--	.03	.38	.01
15...	484	0	2	.02	.01	.21	.51	.22	.31	.12	.10	.04

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WATER QUALITY DATA

DATE	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)
MAR., 1975												
20...	.00	.1	570	160	97	79	110	2.0	30	3.0	11	340
APR.												
03...	.00	.0	540	120	98	72	110	2.1	31	3.3	9.7	340
15...	.01	.2	550	150	98	74	110	2.0	30	1.8	12	310

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WATER QUALITY DATA

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)
MAR., 1975												
20...	.6	14	2	<100	100	0	10	1	10	3	30	10
APR.												
03...	.4	15	1	100	110	0	0	1	20	1	10	30
15...	.3	14	3	<100	120	0	0	0	10	0	0	30

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09306058 - WILLOW CREEK NE RIO BLANCO, CO.

WATER QUALITY DATA

DATE	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)	DIS_SOLVED AMMONIA (NH4) (MG/L) (71846)	DIS_SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_SOLVED NITRITE (NO2) (MG/L) (71856)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)
MAR.. 1975												
20...	10	1	0	901	--	1.23	.04	.03	1.7	.00	.0	6273
APR.												
03...	10	0	0	901	6.91	1.23	.03	.01	1.4	.00	.0	6273
15...	10	1	0	860	8.01	1.17	.04	.03	.93	.03	.0	6273

PROCESS DATE 06/04/75

09306061 - PICEANCE CREEK [illegible] HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	TIME	TYPE	SAMPLE NUMBER (00008)	TEMPERATURE (DEG C) (00010)	WEATHER (00041)	INSTANTANEOUS DISCHARGE (CFS) (00061)	TURBIDITY (JTU) (00070)	COLOR (PLATINUM-COBALT UNITS) (00080)	SPECIFIC CONDUCTANCE (MICROMHOS) (00095)	DISSOLVED OXYGEN (MG/L) (00300)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L) (00340)	PH (UNITS) (00400)
APR., 1974												
23...	1815	2	--	14.0	--	29	--	--	1190	--	--	8.2
MAY												
03...	1645	2	--	7.5	--	30	--	--	1140	7.4	--	8.2
17...	1400	2	--	11.0	--	6.3	--	--	1510	9.2	--	8.1
22...	1545	2	1884	16.0	--	6.2	--	--	1590	9.6	--	8.2
31...	1345	2	--	18.0	--	6.0	--	--	1560	11.3	--	8.2
JUNE												
14...	1410	2	--	21.5	--	4.6	--	--	1540	10.2	--	8.2
21...	1600	2	--	23.0	--	5.5	--	--	1540	12.6	--	8.2
26...	1730	2	--	20.0	--	4.6	--	--	1660	9.8	--	8.0
JULY												
02...	1115	2	--	16.0	--	6.0	--	--	1630	12.0	--	8.2
11...	1330	2	--	21.0	--	4.6	--	--	1580	14.0	--	7.9
20...	1215	2	--	14.5	--	31	--	--	1140	7.6	--	7.6
AUG.												
10...	1415	2	--	18.0	--	19	--	--	1340	6.8	--	8.1
16...	1400	2	--	20.0	--	13	--	--	1360	7.7	--	7.7
31...	1445	2	--	18.0	--	17	--	--	1320	9.6	--	8.2
SEP.												
20...	1245	2	--	13.5	--	--	--	--	1180	9.0	--	8.1
26...	1530	2	--	15.5	--	10	--	--	1330	8.0	--	8.1
OCT.												
04...	1510	2	--	14.0	--	--	--	--	1500	9.8	--	8.7
10...	1130	2	--	12.0	--	5.6	--	--	1500	9.2	--	8.4
17...	1330	2	--	14.0	--	6.3	--	--	1470	8.1	--	8.4
24...	1015	2	--	10.0	--	6.2	--	--	1550	9.0	--	7.8
31...	1230	2	--	8.0	--	--	--	--	1560	9.6	--	8.4
NOV.												
06...	1515	2	--	10.0	--	5.6	--	--	1490	12.4	--	8.4
20...	1330	2	--	6.5	--	--	--	--	1340	16.0	--	8.2
DEC.												
06...	1200	2	751800	5.0	--	19	80	5	1200	11.2	12	8.3
FEB., 1975												
03...	1100	2	--	.0	--	--	10	--	1300	11.0	--	7.5
19...	1215	2	--	.0	--	--	300	5	1360	8.6	--	8.0
MAR.												
06...	1415	2	752600	9.0	--	21	50	30	1200	--	24	8.1
20...	1030	2	--	5.5	--	--	50	8	1225	9.0	--	8.7
APR.												
03...	1200	2	--	3.0	2	20	50	3	1400	9.8	--	7.8

09306061 - PICEANCE CREE[illegible]3 HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	CARBON DIOXIDE (CO2) (MG/L) (00405)	ALKA-LINITY AS CACO3 (MG/L) (00410)	BICAR-BONATE (HCO3) (MG/L) (00440)	CAR-BONATE (CO3) (MG/L) (00445)	TOTAL FILT-RABLE RESIDUE (MG/L) (00515)	TOTAL NON-FILT-RABLE RESIDUE (MG/L) (00530)	OIL AND GREASE (MG/L) (00550)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L) (00608)	DIS-SOLVED NITRITE (N) (MG/L) (00613)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L) (00625)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)
APR., 1974												
23...	5.3	430	524	0	--	--	--	--	--	--	--	.60
MAY												
03...	5.2	419	511	0	--	--	--	--	--	--	--	.64
17...	8.0	518	631	0	--	--	--	--	--	--	--	.62
22...	6.8	553	674	0	--	--	--	--	--	--	--	.35
31...	6.8	550	671	0	--	--	--	--	--	--	--	.15
JUNE												
14...	6.4	522	636	0	--	--	--	--	--	--	--	.08
21...	6.5	527	643	0	--	--	--	--	--	--	--	.08
26...	11	549	669	0	--	--	--	--	--	--	--	.13
JULY												
02...	7.0	566	690	0	--	--	--	--	--	--	--	.19
11...	12	508	619	0	--	--	--	--	--	--	--	.22
20...	20	403	491	0	--	--	--	--	--	--	--	.68
AUG.												
10...	7.6	493	601	0	--	--	--	--	--	--	--	.78
16...	19	479	584	--	--	--	--	--	--	--	--	.32
31...	5.6	458	558	--	--	--	--	--	--	--	--	.33
SEP.												
20...	5.6	363	443	--	--	--	--	--	--	--	--	.42
26...	7.0	452	551	--	--	--	--	--	--	--	--	.35
OCT.												
04...	2.0	504	615	--	--	--	--	--	--	--	--	.31
10...	4.0	511	623	--	--	--	--	--	--	--	--	.31
17...	3.9	502	612	--	--	--	--	--	--	--	--	.29
24...	17	542	661	--	--	--	--	--	--	--	--	.27
31...	4.2	544	663	--	--	--	--	--	--	--	--	.19
NOV.												
06...	3.9	509	620	--	--	--	--	--	--	--	--	.18
20...	5.8	470	573	--	--	--	--	--	--	--	--	.55
DEC.												
06...	4.5	463	565	0	2000	1	8	.08	.01	.64	1.4	.65
FEB., 1975												
03...	30	485	591	0	--	--	8	.04	.01	.68	.46	.69
19...	9.1	468	571	0	--	--	4	.03	.00	.78	1.9	.78
MAR.												
06...	7.0	454	554	0	880	160	4	.09	.01	.62	.99	.63
20...	1.8	455	475	39	--	--	3	.03	.01	.66	.61	.67
APR.												
03...	15	472	576	0	--	--	2	.04	.00	.59	.79	.59

PROCESS DATE 06/04/75

09306061 - PICEANCE CREE[illegible]B HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED OPTHO PHOS-PHATE (PO4) (MG/L) (00660)	TOTAL PHOS-PHORUS (P) (MG/L) (00665)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L) (00671)	TOTAL ORGANIC CARBON (C) (MG/L) (00680)	CYANIDE (CN) (MG/L) (00720)	DIS-SOL-VED SUL-FIDE (S) (MG/L) (00746)	HARD-NESS (CA,MG) (MG/L) (00900)	NON-CAR-BONATE HARD-NESS (MG/L) (00902)	DIS-SOLVED CAL-CIUM (CA) (MG/L) (00915)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) (00925)	DIS-SOLVED SODIUM (NA) (MG/L) (00930)	SODIUM AD-SORP-TION RATIO (00931)
APR., 1974												
23...	.12	--	.04	--	--	--	410	0	75	55	120	2.6
MAY												
03...	.03	--	.01	--	--	--	400	0	73	54	120	2.6
17...	.12	--	.04	--	--	--	510	0	79	76	170	3.3
22...	.15	--	.05	--	--	--	540	0	83	82	180	3.4
31...	.09	--	.03	--	--	--	540	0	84	81	180	3.4
JUNE												
14...	.06	--	.02	--	--	--	520	0	77	80	180	3.4
21...	.03	--	.01	--	--	--	520	0	78	79	180	3.4
26...	.09	--	.03	--	--	--	540	0	77	84	200	3.8
JULY												
02...	.00	--	.00	--	--	--	570	6	84	88	180	3.3
11...	.21	--	.07	--	--	--	530	22	77	82	200	3.8
20...	.09	--	.03	--	--	--	370	0	72	47	120	2.7
AUG.												
10...	.18	--	.06	--	--	--	450	0	79	62	150	3.1
16...	.03	--	.01	--	--	--	440	0	67	65	160	3.3
31...	.09	--	.03	--	--	--	450	0	75	64	150	3.1
SEP.												
20...	.06	--	.02	--	--	--	450	82	73	64	150	3.1
26...	.09	--	.03	--	--	--	470	16	77	67	140	2.8
OCT.												
04...	.18	--	.06	--	--	--	430	0	59	69	180	3.8
10...	.03	--	.01	--	--	--	500	0	75	76	170	3.3
17...	.09	--	.03	--	--	--	490	0	82	69	180	3.5
24...	.12	--	.04	--	--	--	530	0	83	78	170	3.2
31...	.09	--	.03	--	--	--	560	11	87	82	180	3.3
NOV.												
06...	.03	--	.01	--	--	--	520	13	85	75	170	3.2
20...	.03	--	.01	--	--	--	450	0	81	60	150	3.1
DEC.												
06...	.06	.13	.02	--	.00	.2	490	26	87	66	140	2.8
FEB., 1975												
03...	.25	.11	.08	--	.00	.2	500	11	88	67	140	2.7
19...	.21	.21	.07	--	.03	.0	500	30	84	70	140	2.7
MAR.												
06...	.15	.22	.05	8.2	.00	.2	470	11	81	64	130	2.6
20...	.09	.06	.03	--	.00	.1	490	38	82	70	130	2.5
APR.												
03...	.03	.24	.01	--	.00	.1	470	0	83	64	140	2.8

09306061 - PICEANCE CREEK AB HUNTER C. NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	PERCENT SODIUM (00932)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L) (00935)	DIS-SOLVED CHLO-RIDE (CL) (MG/L) (00940)	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED FLUO-RIDE (F) (MG/L) (00950)	DIS-SOLVED SILICA (SIO2) (MG/L) (00955)	DIS-SOLVED ARSENIC (AS) (UG/L) (01000)	DIS-SOLVED BARIUM (BA) (UG/L) (01005)	DIS-SOLVED BERYL-LIUM (BE) (UG/L) (01010)	DIS-SOLVED BISMUTH (BI) (UG/L) (01015)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED CAD-MIUM (CD) (UG/L) (01025)
APR., 1974												
23...	38	3.3	13	220	1.0	16	--	--	--	--	--	--
MAY												
03...	39	3.7	11	220	.9	17	--	--	--	--	--	--
17...	42	3.8	14	350	.7	19	1	--	--	--	--	--
22...	42	3.9	15	350	.6	18	2	70	<7	<14	190	0
31...	42	4.2	15	350	1.5	17	3	0	--	--	240	1
JUNE												
14...	43	4.2	16	330	.7	16	3	100	--	--	240	1
21...	43	4.0	15	340	.6	16	3	0	--	--	240	0
26...	44	6.4	16	360	.7	15	3	<100	--	--	240	1
JULY												
02...	40	3.8	15	350	.6	17	6	<100	--	--	250	0
11...	45	4.1	16	380	.7	14	4	<100	--	--	270	2
20...	41	5.5	13	220	.5	12	3	0	--	--	320	1
AUG.												
10...	42	4.3	15	270	.7	20	3	0	--	--	230	<1
16...	44	4.7	15	260	.3	19	2	0	--	--	240	2
31...	42	4.2	15	280	.7	18	2	100	--	--	230	<1
SEP.												
20...	42	2.5	13	280	.7	17	4	0	--	--	200	1
26...	39	3.6	12	280	.8	18	0	0	--	--	180	<1
OCT.												
04...	48	1.2	14	300	.7	20	2	0	--	--	270	0
10...	42	3.5	14	290	.6	19	2	<100	--	--	230	1
17...	44	3.8	14	320	.6	19	2	<100	--	--	200	0
24...	41	4.3	14	330	.6	19	2	0	--	--	230	0
31...	41	3.5	15	330	.7	19	1	<100	--	--	170	0
NOV.												
06...	41	4.0	15	330	.6	17	2	<100	--	--	220	5
20...	42	3.0	13	260	.7	17	4	<100	--	--	200	0
DEC.												
06...	38	2.6	12	280	.6	16	3	<100	--	--	220	1
FEB., 1975												
03...	38	2.7	13	320	.6	17	5	<100	--	--	150	1
19...	38	2.6	14	310	.7	16	1	<100	--	--	160	1
MAR.												
06...	37	4.8	13	250	.7	15	1	100	--	--	170	0
20...	36	3.9	14	260	.9	13	0	<100	--	--	160	0
APR.												
03...	39	5.0	14	280	.7	15	0	<100	--	--	160	0

PROCESS DATE 06/04/75

09306061 - PICEANCE CRE[illegible]AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED CHRO-MIUM (CR) (UG/L) (01030)	DIS-SOLVED COBALT (CO) (UG/L) (01035)	DIS-SOLVED COPPER (CU) (UG/L) (01040)	DIS-SOLVED IRON (FE) (UG/L) (01046)	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MAN-GANESE (MN) (UG/L) (01056)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRON-TIUM (SR) (UG/L) (01080)	DIS-SOLVED VANA-DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)
APR., 1974												
23...	--	--	--	110	--	30	--	--	--	--	--	--
MAY												
03...	--	--	--	20	--	10	--	--	--	--	--	--
17...	--	--	--	20	--	60	--	--	--	--	--	--
22...	<10	<20	<5	50	<20	70	7	<10	<3	2400	<10	<10
31...	--	--	2	20	7	100	--	--	--	--	--	20
JUNE												
14...	--	--	9	20	8	100	--	--	--	--	--	20
21...	--	--	2	20	5	110	--	--	--	--	--	20
26...	--	--	3	50	4	190	--	--	--	--	--	30
JULY												
02...	--	--	1	30	2	150	--	--	--	--	--	20
11...	--	--	5	20	3	150	--	--	--	--	--	10
20...	--	--	20	130	4	70	--	--	--	--	--	50
AUG.												
10...	--	--	3	70	2	80	--	--	--	--	--	20
16...	--	--	6	40	1	60	--	--	--	--	--	0
31...	--	--	6	880	8	10	--	--	--	--	--	10
SEP.												
20...	--	--	7	90	1	60	--	--	--	--	--	40
26...	--	--	6	40	2	20	--	--	--	--	--	10
OCT.												
04...	--	--	4	10	0	0	--	--	--	--	--	10
10...	--	--	2	50	10	150	--	--	--	--	--	30
17...	--	--	0	30	3	150	--	--	--	--	--	10
24...	--	--	2	30	2	170	--	--	--	--	--	20
31...	--	--	2	10	0	140	--	--	--	--	--	0
NOV.												
06...	--	--	2	460	5	150	--	--	--	--	--	10
20...	--	--	0	10	2	60	--	--	--	--	--	10
DEC.												
06...	0	--	2	110	1	40	--	--	--	--	--	30
FEB., 1975												
03...	10	--	5	30	2	40	--	--	--	--	--	30
19...	0	--	10	20	1	30	--	--	--	--	--	40
MAR.												
06...	0	--	2	60	2	30	--	--	--	--	--	10
20...	0	--	2	30	3	30	--	--	--	--	--	20
APR.												
03...	0	--	1	10	0	0	--	--	--	--	--	20

09306061 - PICEANCE CREEK [illegible] HUNTER C. NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS-SOLVED TIN (SN) (UG/L) (01100)	DIS-SOLVED ALUM-INUM (AL) (UG/L) (01106)	DIS-SOLVED GALLIUM (GA) (UG/L) (01120)	DIS-SOLVED GER-MANIUM (GE) (UG/L) (01125)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED SELE-NIUM (SE) (UG/L) (01145)	DIS-SOLVED TI-TANIUM (TI) (UG/L) (01150)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L) (01160)	ATMOS-PHERIC ODOR (SEVER-ITY) (01330)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L) (03515)	SUS-PENDED GROSS BETA AS CS-137 (PC/L) (03516)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L) (09511)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	0	--	--	--
17...	--	--	--	--	--	0	--	--	0	--	--	--
22...	<15	50	<10	<20	6	1	<10	<30	0	--	--	--
31...	--	--	--	--	10	1	--	--	0	--	--	--
JUNE												
14...	--	--	--	--	10	2	--	--	0	--	--	--
21...	--	--	--	--	10	1	--	--	0	--	--	--
26...	--	--	--	--	0	1	--	--	0	--	--	--
JULY												
02...	--	--	--	--	0	2	--	--	0	--	--	--
11...	--	--	--	--	0	1	--	--	0	--	--	--
20...	--	--	--	--	0	0	--	--	0	--	--	--
AUG.												
10...	--	--	--	--	0	1	--	--	0	--	--	--
16...	--	--	--	--	0	1	--	--	0	--	--	--
31...	--	--	--	--	0	1	--	--	0	--	--	--
SEP.												
20...	--	--	--	--	0	0	--	--	0	--	--	--
26...	--	--	--	--	0	1	--	--	0	--	--	--
OCT.												
04...	--	--	--	--	0	1	--	--	0	--	--	--
10...	--	--	--	--	0	1	--	--	0	--	--	--
17...	--	--	--	--	0	1	--	--	0	--	--	--
24...	--	--	--	--	0	1	--	--	0	--	--	--
31...	--	--	--	--	0	0	--	--	0	--	--	--
NOV.												
06...	--	--	--	--	0	1	--	--	0	--	--	--
20...	--	--	--	--	0	1	--	--	0	--	--	--
DEC.												
06...	--	--	--	--	10	1	--	--	0	43	<.4	.05
FEB., 1975												
03...	--	--	--	--	10	1	--	--	0	--	--	--
19...	--	--	--	--	20	1	--	--	0	--	--	--
MAR.												
06...	--	--	--	--	20	1	--	--	0	8.3	6.9	--
20...	--	--	--	--	20	1	--	--	0	--	--	--
APR.												
03...	--	--	--	--	10	1	--	--	0	--	--	--

PROCESS DAT 06/04/75

09306061 - PICEANCE CRE AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	FECAL COLI-FORM (COL. PER 100 ML) (31616)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR-DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI-ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	TOX-APHENE (UG/L) (39400)	HEPTA-CHLOR (UG/L) (39410)	HEPTA-CHLOR EPOXIDE (UG/L) (39420)
APR., 1974												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
02...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
AUG.												
10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
SEP.												
20...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
OCT.												
04...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
NOV.												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
DEC.												
06...	3	.00	.00	.0	.00	.00	.00	.00	.00	0	.00	.00
FEB., 1975												
03...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR.												
06...	12	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
APR.												
03...	--	--	--	--	--	--	--	--	--	--	--	--

09306061 - PICEANCE CREE AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	PCB (UG/L) (39516)	MALA-THION (UG/L) (39530)	PARA-THION (UG/L) (39540)	DI-AZINON (UG/L) (39570)	METHYL PARA-THION (UG/L) (39600)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) (70301)	DIS-SOLVED SOLIDS (TONS PER DAY) (70302)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L) (70507)
APR.. 1974												
23...	--	--	--	--	--	--	--	--	765	60.3	1.04	--
MAY												
03...	--	--	--	--	--	--	--	--	754	61.1	1.03	--
17...	--	--	--	--	--	--	--	--	1030	17.6	1.40	--
22...	--	--	--	--	--	--	--	--	1070	18.0	1.46	--
31...	--	--	--	--	--	--	--	--	1060	17.4	1.44	--
JUNE												
14...	--	--	--	--	--	--	--	--	1020	12.8	1.39	--
21...	--	--	--	--	--	--	--	--	1030	15.4	1.40	--
26...	--	--	--	--	--	--	--	--	1090	13.7	1.48	--
JULY												
02...	--	--	--	--	--	--	--	--	1080	17.5	1.47	--
11...	--	--	--	--	--	--	--	--	1080	13.5	1.47	--
20...	--	--	--	--	--	--	--	--	736	61.6	1.00	--
AUG.												
10...	--	--	--	--	--	--	--	--	901	48.4	1.23	--
16...	--	--	--	--	--	--	--	--	881	30.9	1.20	--
31...	--	--	--	--	--	--	--	--	885	40.6	1.20	--
SEP.												
20...	--	--	--	--	--	--	--	--	821	--	1.12	--
26...	--	--	--	--	--	--	--	--	872	24.0	1.19	--
OCT.												
04...	--	--	--	--	--	--	--	--	949	--	1.29	--
10...	--	--	--	--	--	--	--	--	957	14.7	1.30	--
17...	--	--	--	--	--	--	--	--	992	17.1	1.35	--
24...	--	--	--	--	--	--	--	--	1030	17.5	1.40	--
31...	--	--	--	--	--	--	--	--	1050	--	1.43	--
NOV.												
06...	--	--	--	--	--	--	--	--	1000	15.1	1.36	--
20...	--	--	--	--	--	--	--	--	870	--	1.18	--
DEC.												
06...	.0	.00	.00	.00	.00	.00	.00	.00	887	46.9	1.21	.06
FEB.. 1975												
03...	--	--	--	--	--	--	--	--	944	--	1.28	--
19...	--	--	--	--	--	--	--	--	923	--	1.26	.06
MAR.												
06...	--	--	--	--	--	--	--	--	835	47.3	1.14	.10
20...	--	--	--	--	--	--	--	--	851	--	1.16	.04
APR.												
03...	--	--	--	--	--	--	--	--	889	50.2	1.21	.04

09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

WATER QUALITY DATA

DATE	DIS_ SOLVED AMMONIA (NH4) (MG/L) (71846)	DIS_ SOLVED NITRATE (NO3) (MG/L) (71851)	DIS_ SOLVED NITRITE (NO2) (MG/L) (71856)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL) (72000)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L) (80060)
APR., 1974									
23...	--	--	--	--	6214	--	--	--	--
MAY									
03...	--	--	--	--	6214	--	--	--	--
17...	--	--	--	.0	6214	--	--	--	--
22...	--	--	--	.0	6214	--	--	--	--
31...	--	--	--	.0	6214	--	--	--	--
JUNE									
14...	--	--	--	.0	6214	--	--	--	--
21...	--	--	--	.0	6214	--	--	--	--
26...	--	--	--	.0	6214	--	--	--	--
JULY									
02...	--	--	--	.0	6214	--	--	--	--
11...	--	--	--	.0	6214	--	--	--	--
20...	--	--	--	.0	6214	--	--	--	--
AUG.									
10...	--	--	--	.5	6214	--	--	--	--
16...	--	--	--	.0	6214	--	--	--	--
31...	--	--	--	.0	6214	--	--	--	--
SEP.									
20...	--	--	--	.0	6214	--	--	--	--
26...	--	--	--	.0	6214	--	--	--	--
OCT.									
04...	--	--	--	.0	6214	--	--	--	--
10...	--	--	--	.0	6214	--	--	--	--
17...	--	--	--	.0	6214	--	--	--	--
24...	--	--	--	.0	6214	--	--	--	--
31...	--	--	--	.0	6214	--	--	--	--
NOV.									
06...	--	--	--	.0	6214	--	--	--	--
20...	--	--	--	.0	6214	--	--	--	--
DEC.									
06...	.10	2.8	.03	<.1	6214	<25	<.4	34	<.4
FEB., 1975									
03...	.05	3.0	.03	.1	6214	--	--	--	--
19...	.04	3.5	.00	.0	6214	--	--	--	--
MAR.									
06...	.12	2.7	.03	.0	6214	<12	8.1	6.9	5.7
20...	.04	2.9	.03	.0	6214	--	--	--	--
APR.									
03...	.05	2.6	.00	.0	6214	--	--	--	--

Springs and Seeps

II A-2 SPRINGS & SEEPS

Samples were obtained from selected springs this past quarter for radiocarbon age determination. Two springs were analyzed for major constituents. The location of springs reported in this report is shown in Figure II A-2. A summary of the water analysis can be found on Table II A-16. Data pertaining to the radiocarbon analysis follows.

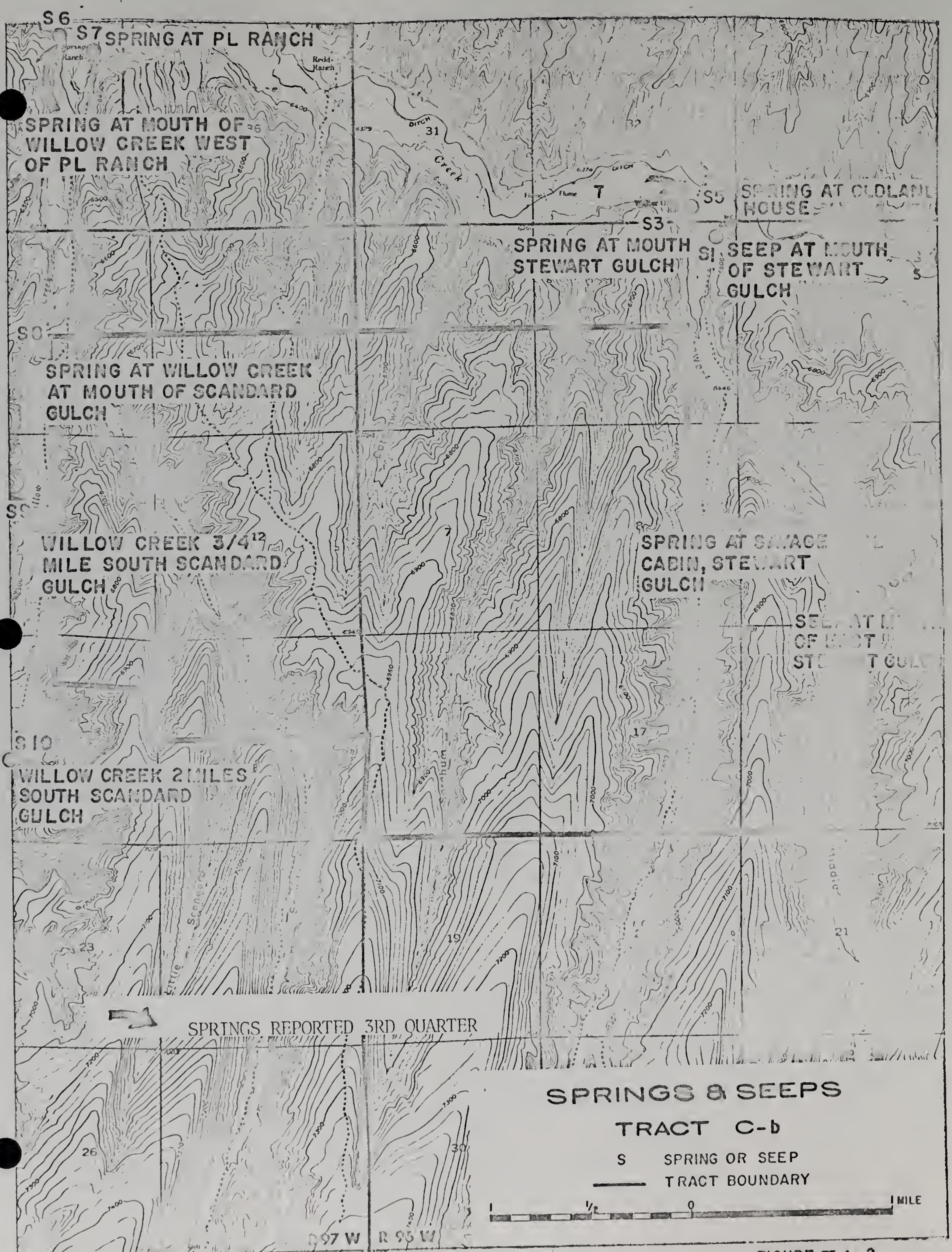

S6
S7 SPRING AT PL RANCH
Reddi Ranch
SPRING AT MOUTH OF WILLOW CREEK WEST OF PL RANCH
DITCH
31
Creek
32
Flume
7
S5
SPRING AT OLDLAND HOUSE
S3
SPRING AT MOUTH STEWART GULCH
S1
SEEP AT MOUTH OF STEWART GULCH
S8
SPRING AT WILLOW CREEK AT MOUTH OF SCANDARD GULCH
S9
WILLOW CREEK 3/4 MILE SOUTH SCANDARD GULCH
12
7
SPRING AT SAVAGE CABIN, STEWART GULCH
SEEP AT OF STEWART GUL
17
S10
WILLOW CREEK 2 MILES SOUTH SCANDARD GULCH
19
21
23
Scandard
Middle
SPRINGS REPORTED 3RD QUARTER
26
30
R 97 W
R 96 W
SPRINGS & SEEPS
TRACT C-b
S SPRING OR SEEP
TRACT BOUNDARY
1
1/2
0
1 MILE

FIGURE II A-2

TELEDYNE
ISOTOPES

WESTWOOD LABORATORIES
50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070 TELEX 134474

24 April 1975

Mr. Donald Tait
Atlantic Richfield Corporation
1500 Security Life Building
Denver, Colorado 80202

W. O. No. 3-3520-272

Dear Mr. Tait:

We have listed below the radiocarbon ages we have determined on the samples you submitted for analysis.

ISOTOPES Sample Number	Sample	$-\delta C^{14}$	Age in Years B.P.
I-8517	AT-1 (REPL-1)	929 ± 8	21,250 ± 950
I-8534	AT-1 (REPL-2)	938 ± 8	22,320 ± 1000
I-8535	Oldland Walter	358 ± 18	3,560 ± 230
I-8536	Savage Cabin Sp.	507 ± 10	5,680 ± 165
I-8537	Sp. at P. L. Ranch	308 ± 17	2,960 ± 195
I-8538	Sp. at Scandard Gulch	294 ± 19	2,800 ± 215

The C^{13}/C^{12} ratios relative to the P.D.B. standard are as follows:

AT-1 (REPL-1)	- 1.5
AT-1 (REPL-2)	- 0.9
Oldland Walter	- 7.7
Savage Cabin Sp.	- 6.0
Sp. at P. L. Ranch	- 9.2
Sp. at Scandard Gulch	- 8.6

If you have any questions concerning these results, please contact us. We shall be happy to help in any way possible.

RECEIVED
APR 28 1975
D. B. TAIT

24 April 1975

Mr. Donald Tait
Atlantic Richfield Corporation
Page two

We have in storage your two most recent sample shipments and will hold them until hearing from you.

Sincerely yours,

James Buckley

James Buckley

JB:pg
Enclosures

TABLE A-15
TRACT C-b RADIOCARBON ANALYSIS
SELECTED SPRINGS

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% ASH-WGHT-% * U/M **	MID-COUNT TIME DATE	TIME	VOLUME - UNITS	LAB.
09187	AT 2 REPLICA 2		01/01				H-3	1.3 +-0.4 E+01		04/03			5
09188	OLDLAND H2O STEWART		01/09				H-3	1.33+-0.15E+02		04/03			5
09189	SAVAGE CABIN SPRING		01/09				H-3	9.4 +-1.1 E+01		04/03			5
09190	PL RANCH WILLOW CK		01/09				H-3	1.22+-0.15E+02		04/04			5
09191	SCANDARD GULCH		01/09				H-3	1.35+-0.15E+02		04/03			5

LAST PAGE OF REPORT

APPROVED BY K. ROACH 04/10/75
KRoach

SEND 3 COPIES TO AT317S MR D B TAIT, GROUP GEOLOGIST

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TABLE II A-16
WATER ANALYSIS
SPRINGS & SEEPS

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	a	b			
1. Aluminum		6.1			
2. Ammonia (Nitrogen)		.1			
3. Arsenic		<.01			
4. Barium		<1.0			
5. Beryllium					
6. Bicarbonate	650	540			
7. Bismuth					
8. Boron		.6			
9. Cadmium		<.01			
10. Calcium	48	161			
11. Carbonate	<.1	<.1			
12. Cerium					
13. Chloride	17	.8			
14. Chrome, Hexavalent		<.01			
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)					
17. Copper		<.1			
18. Fluoride	.2	1.4			
19. Gallium					
20. Hardness (mg/1 CaCO$_3$)	440	516			
21. Hydroxide		<.1			
22. Iron	<.05	<.47			
23. Lead		<.05			
24. Lithium		<.5			
25. Magnesium	78	28			
26. Manganese		<.05			
27. Mercury		<.01			
28. Molybdenum					
29. Nickel					
30. Nitrate	.5	.1			
31. pH	7.4				
32. Phosphate, Total	<.1	<.1			
33. Potassium					
34. Selenium		<.01			
35. Silica	21	13			
36. Sodium	240	125			
37. Solids, Dissolved	1090	910			
38. Strontium					
39. Sulfate	370	310			
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc		<.5			
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

a Spring floor of Piceance Creek Valley North of SG-19.
b Willow Creek 2 miles past Scandard Gulch.

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211

TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7363

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Spring floor of Piceance Creek Valley
North of SG-19

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	48	2.395
Magnesium	78	6.418
Sodium	240	10.440
Carbonate	Less than 0.1	---
Bicarbonate	650	10.654
Chloride	17	0.480
Sulfate	370	7.703
Nitrate	0.5	---
Phosphate	Less than 0.1	---
Silicon dioxide	21	0.699
Iron	Less than 0.05	---
Fluoride	0.2	---
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	530	
Hardness, in terms of calcium carbonate	440	
Total dissolved solids (calculated)	1,090	

pH 7.4

corrected copy

MEM[illegible]S OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 10/17/74
DATE REPORTED: 11/1/74

LAB. NUMBER: 5733

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

AMPLE MARKED: Willow Creek 2 Miles Past Scandard

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	161	8.034
Magnesium	28	2.304
Sodium	125	5.399
Carbonate	Less than 0.1	---
Bicarbonate	540	8.855
Chloride	0.8	---
Sulfate	310	5.449
Nitrate	0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	13	0.433
Iron	0.47	
Fluoride	1.4	
P. alkalinity, in terms of calcium carbonate	--	
MO alkalinity, in terms of calcium carbonate	--	
Hardness, in terms of calcium carbonate	516	
Total dissolved solids	910	
Ammonia	0.1	
Lithium	Less than 0.5	
Barium	Less than 1.0	
Hexavalent chromium	Less than 0.01	
Selenium	Less than 0.01	
Arsenic	Less than 0.01	
Boron	0.6	
Hydroxide	Less than 0.1	

	MILLIGRAMS PER LITER
Aluminum	6.1
Copper	Less than 0.1
Cadmium	Less than 0.01
Lead	Less than 0.05
Manganese	Less than 0.05
Silver	Less than 0.01
Zinc	Less than 0.5
Mercury	Less than 0.01

pH 7.9
Specific conductance 1,180 micromhos per cc

MBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Ochs
CHEMIST

S REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

CORE DRILLING AND ASSOCIATED GROUND WATER

Well Survey Plats

II B-1 WELL SURVEY PLATS

The following Well Survey Plats are included in this report:

A) SG-1a
B) NQ-7 *
C) NQ-12 *

An additional plat showing the geographic relationship between SG-1 and SG-1a is included.

The following Well Survey Plats are in Quarterly Report #1:

A) all Alluvial Wells
B) all Aquifer Test Wells
C) all C-b Wells
D) Sorghum Gulch (SG) Wells numbers
1, 6, 8, 9, 10, 10a, 11, 17, 18, 18a, 19, 20, 21

No Well Survey Plats were reported in Quarterly Report #2.

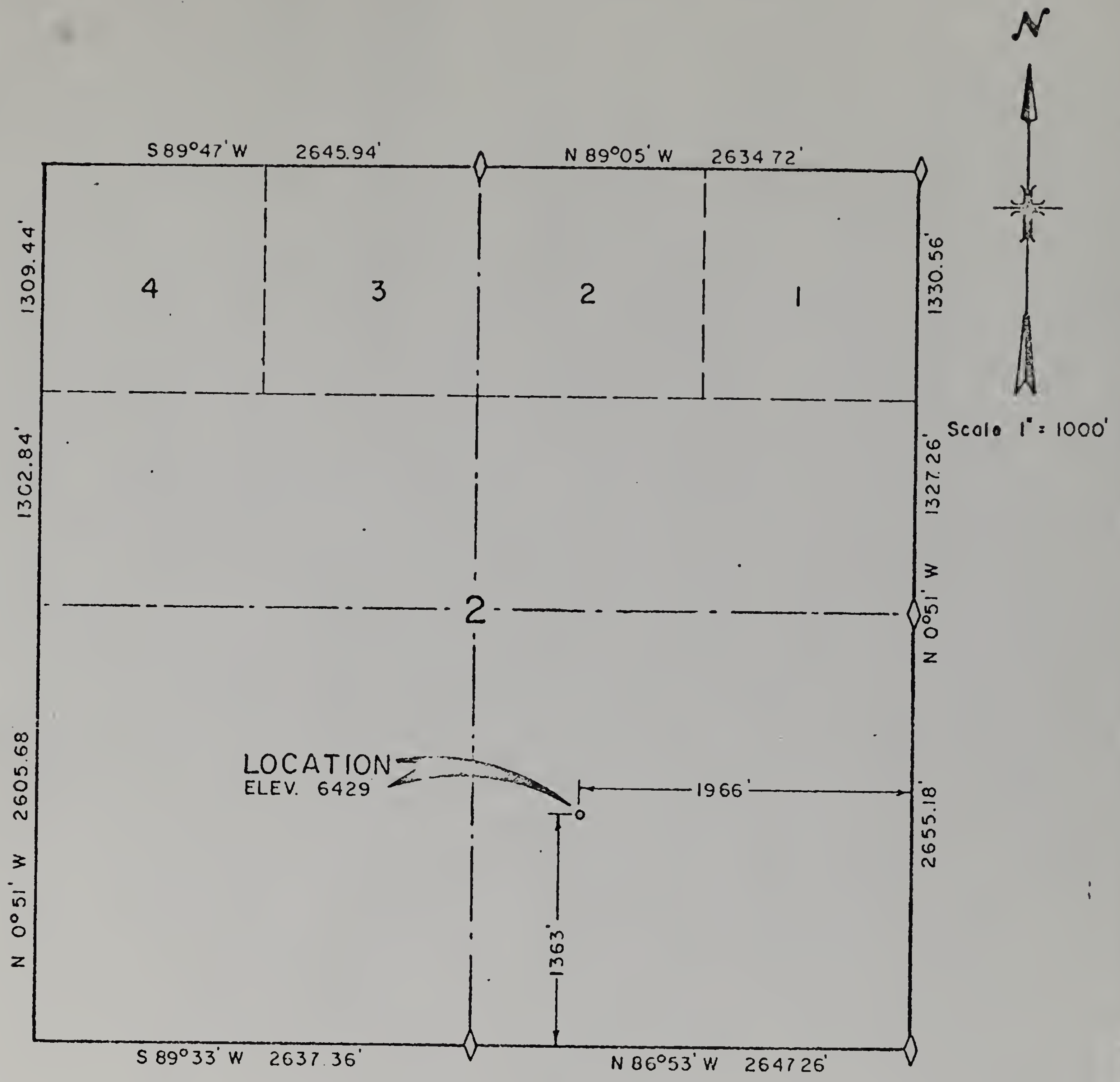
* Slant holes

4 slant hole reported
NQ-4, NQ-22, NQ-7, NQ-12
Sec. 11
SE¼ NE¼

≈ 55' South
of 14x7
on AT Pad
Trends S30E
1800' deep
& ~ 1800'

FIGURE II B-2

CORE HOLE LOCATION
1363.0 FT. N.S.L. – 1966.0 FT. W.E.L.
SECTION 2, T 3 S, R 97 W 6TH P.M.


N
S 89°47' W 2645.94'
N 89°05' W 2634 72'
1309.44'
4
3
2
1
1330.56'
Scale 1" = 1000'
1302.84'
1327.26'
2
N 0°51' W
LOCATION
ELEV. 6429
1966'
2605.68
N 0°51' W
2655.18'
1363'
S 89°33' W 2637.36'
N 86°53' W 2647 26'

NOTE: Elevation Referred to U.S.G.S. Datum

I, David L Bear do hereby certify that this plat was plotted from notes of a field survey made under my direct responsibility, supervision and checking on June 13, 19 75.

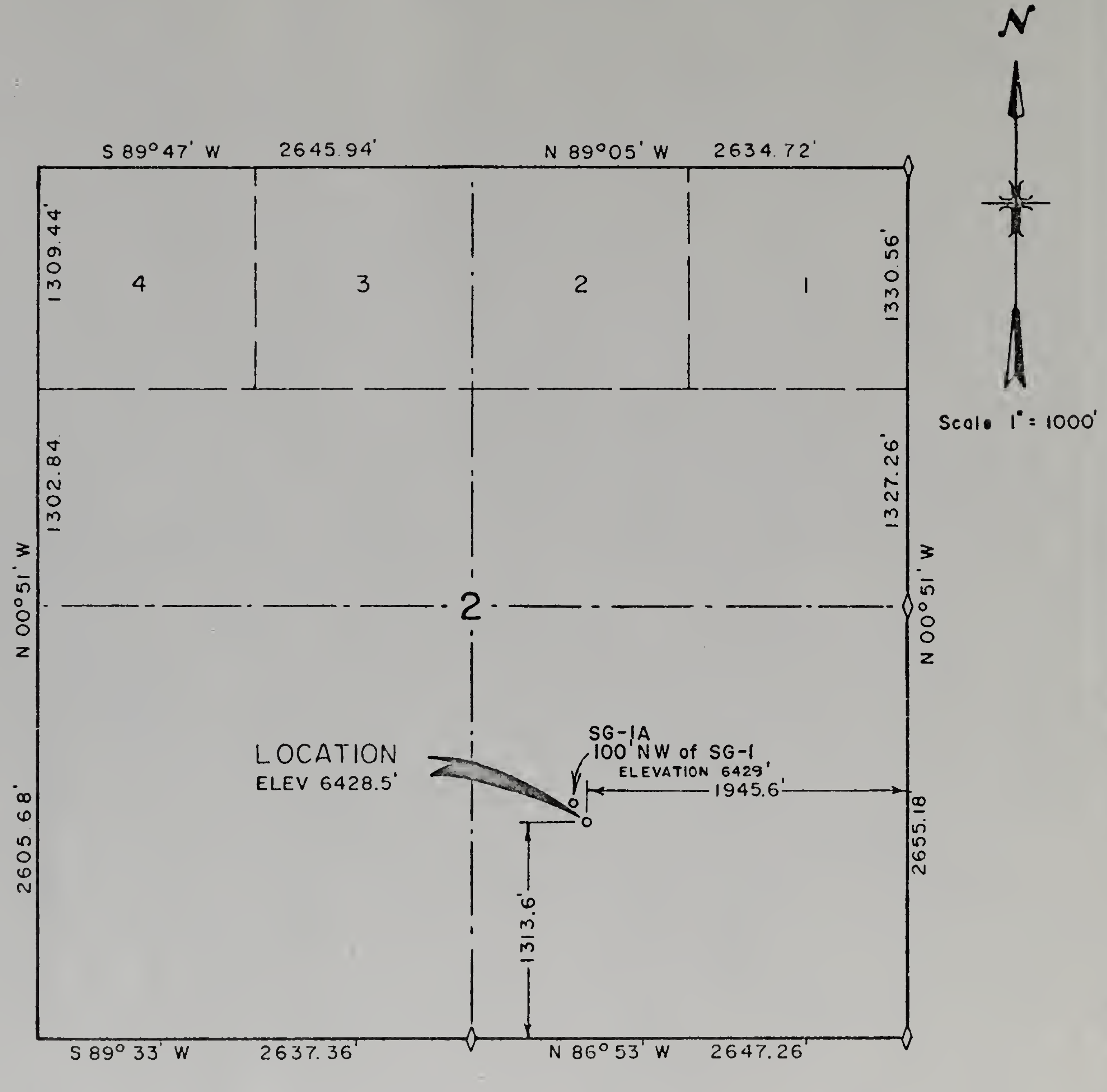
David L Bear
Registered Land Surveyor

WESTERN ENGINEERS, INC.
CORE HOLE LOCATION
ATLANTIC RICHFIELD COMPANY
SG-1-A
RIO BLANCO COUNTY, COLORADO
SURVEYED D.L.B. DRAWN R.W.O.
GRAND JUNCTION, COLO. 6/17/75

FIGURE II B-3

CORE HOLE LOCATION

1313.6FT N.S.L. — 1945.6 FT W.E.L.
SECTION 2, T 3 S, R 97 W, 6TH P.M.


N
Scale 1" = 1000'
S 89°47' W
2645.94'
N 89°05' W
2634.72'
1309.44'
4
3
2
1
1330.56'
1302.84
1327.26'
N 00°51' W
2
N 00°51' W
LOCATION
ELEV 6428.5'
SG-1A
100' NW of SG-1
ELEVATION 6429'
1945.6'
2605.68'
2655.18
1313.6'
S 89° 33' W
2637.36'
N 86°53' W
2647.26'

NOTE – Elevation referred to U.S.G.S. Datum

I, David L. Bear do hereby certify that this plat was plotted from notes of a field survey made under my direct responsibility, supervision and checking on Apr. 4, 19 74.

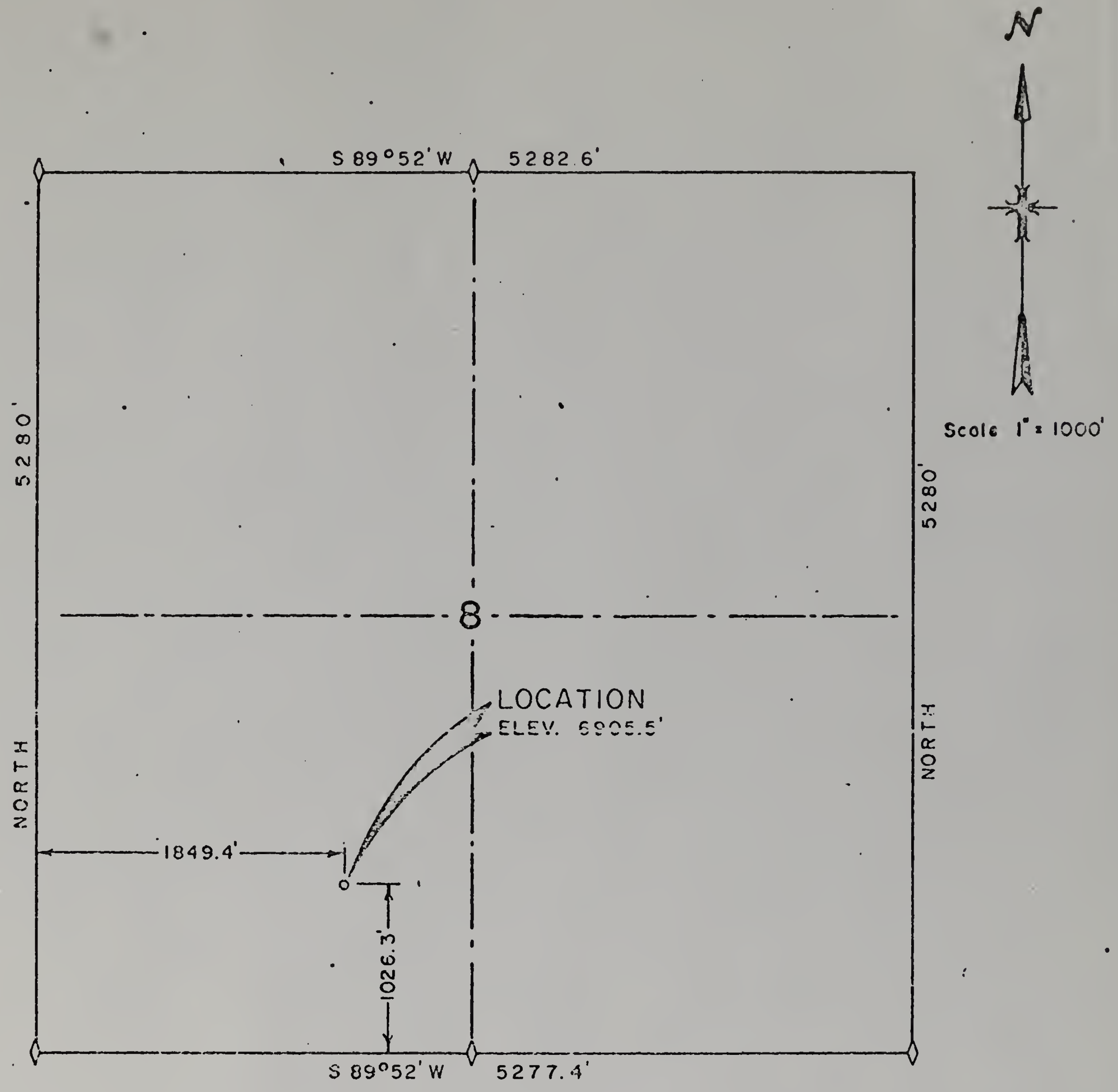
Registered Land Surveyor

REVISED 6/10/74

WESTERN ENGINEERS, INC.
CORE HOLE LOCATION
ATLANTIC RICHFIELD COMPANY
SG-1 & SG-1A
RIO BLANCO COUNTY, COLORADO
SURVEYED D.L.B. DRAWN R.W.O.
GRAND JUNCTION, COLO. 4/9/74

FIGURE II B-4

CORE HOLE LOCATION
1026.3FT N.S.L. — 1849.4FT. E.W.L.
SECTION 8, T 3 S, R 96 W, 6TH P.M.


N
Scale 1" = 1000'
S 89°52' W
5282.6'
5280'
5280'
NORTH
NORTH
8
LOCATION
ELEV. 6905.5'
1849.4'
1026.3'
S 89°52' W
5277.4'

NOTE — Elevation referred to U.S.G.S. Datum.

I, Clarence J Bielak do hereby certify that this plat was plotted from notes of a field survey made under my direct responsibility, supervision and checking on Apr. 4, 19 74.

Clarence J Bielak
Registered Land Surveyor

REVISED 4/11/74

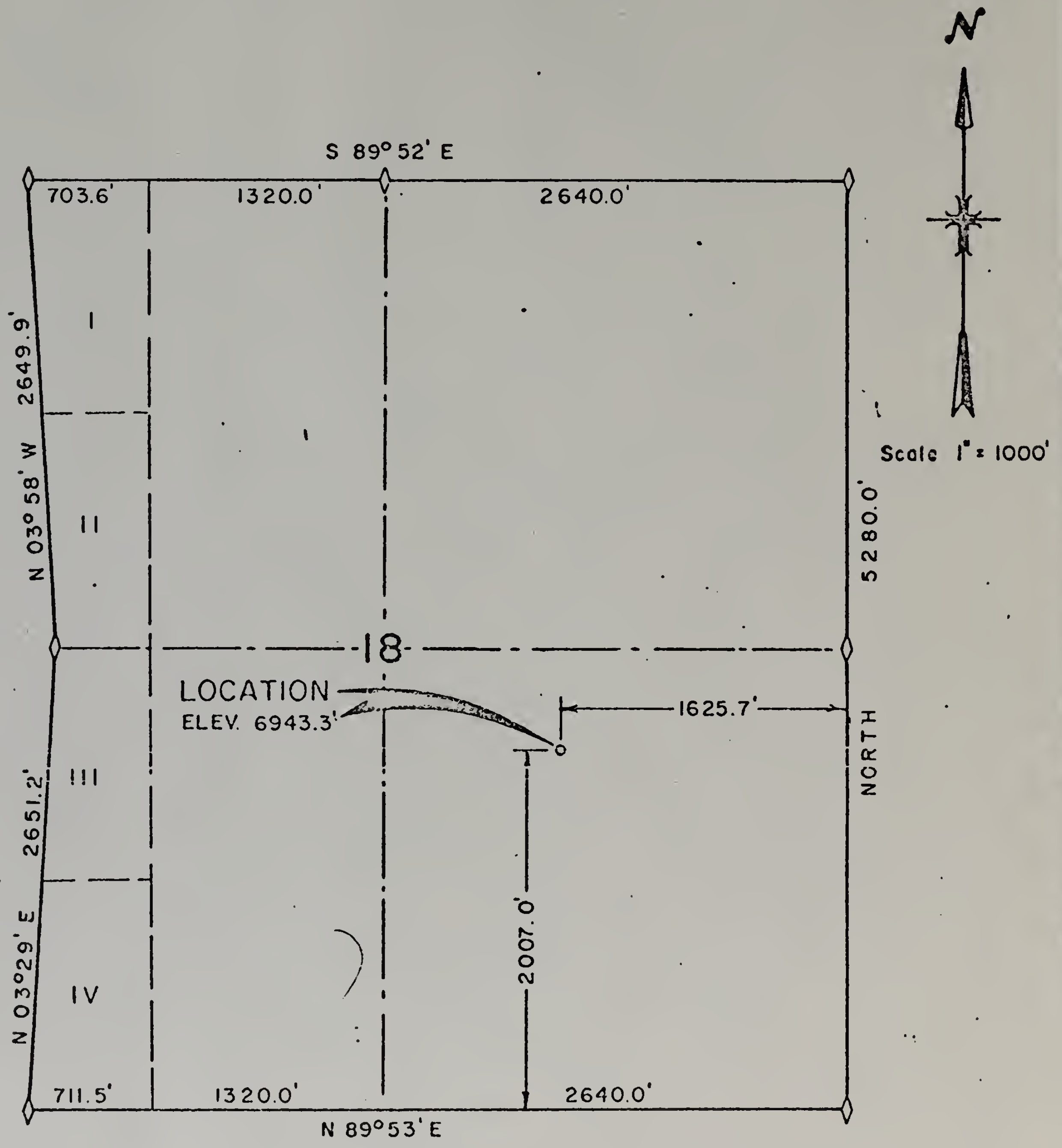
WESTERN ENGINEERS, INC.
CORE HOLE LOCATION
ATLANTIC RICHFIELD COMPANY
NQ-7

RIO BLANCO COUNTY, COLORADO
SURVEYED C.J.B. DRAWN BY G
GRAND JUNCTION, COLO. [illegible]

FIGURE II B-5

CORE HOLE LOCATION

2007.0 FT. N.S.L. – 1625.7 FT. W.E.L.
SECTION 18, T 3 S, R 96 W, 6TH P.M.


N
Scale 1" = 1000'
S 89° 52' E
703.6'
1320.0'
2640.0'
N 03° 58' W 2649.9'
I
II
5280.0'
18
LOCATION
ELEV. 6943.3'
1625.7'
NORTH
III
IV
N 03°29' E 2651.2'
2007.0'
711.5'
1320.0'
2640.0'
N 89°53' E

NOTE – Elevation referred to U.S.G.S. Datum

I, Clarence J Bielak do hereby certify that this plat was plotted from notes of a field survey made under my direct responsibility, supervision and checking on Apr. 3, 1974.

Clarence J. Bielak
Registered Land Surveyor

WESTERN ENGINEERS, INC.
CORE HOLE LOCATION
ATLANTIC RICHFIELD COMPANY
NQ-12
RIO BLANCO COUNTY, COLORADO
SURVEYED C.J.B. DRAWN R.W.O.
GRAND JUNCTION, COLO. 4/0/7

Completion Data

II B-2 WELL COMPLETION DATA

Included in this section of Quarterly Report #3 is the well completion data for SG-1. This updates and finalizes the completion information for SG-1 found in Quarterly Report #2.

The completion data for the following wells are in Quarterly Report #1.

- AT-1
- AT-1a
- AT-1a1
- AT-1b
- AT-1c
- AT-1d
- A-1
- A-2
- A-3
- A-4
- A-5
- A-6
- A-7
- A-8
- A-9
- A-10
- A-11
- A-12
- A-13

- SG-6
- SG-9
- SG-10
- SG-10a
- SG-11
- SG-18
- SG-18a
- SG-19
- Cb-1
- Cb-2
- Cb-2b
- Cb-3
- Cb-4

The completion data for the following wells are in Quarterly Report #2.

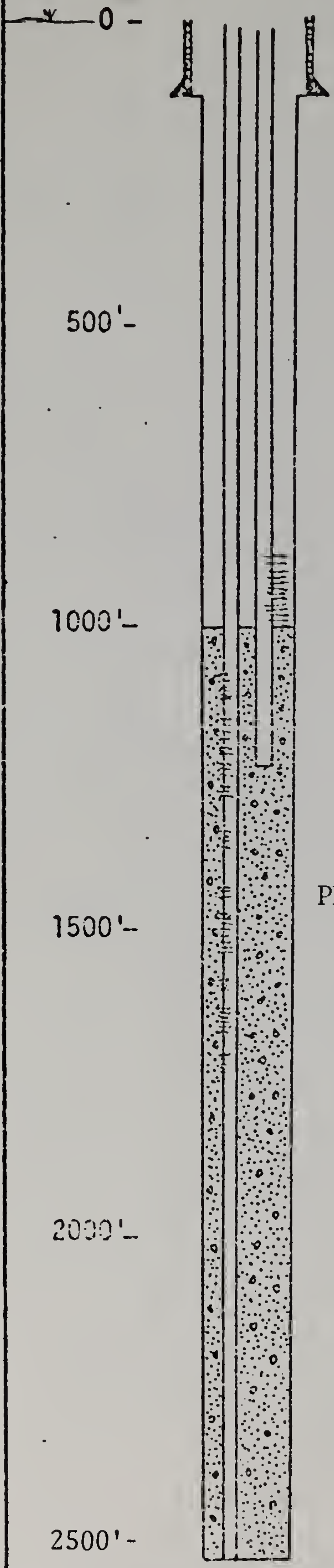
- AT-1
- Cb-2
- SG-1
- SG-1a
- SG-8
- SG-17
- SG-20
- SG-21

FIGURE II B-6

SG - 1

C-b Tract

Section 2, 3S, 97W



8 5/8" at 151' Cemented to Surface

#1 String to 2519' PBTD 2480

#2 String to 1234' PBTD 1240

Cemented 2-7-75 w/385sx

Recemented 3-15-75 w/100 sx, 4% gel, 10#/sx Calseal, 2% Calcium Chloride

Top of Cement by Log at 900' ±

6 3/4" Hole to 2525' Total Depth

PERFORATIONS:

No. 1 - Long String

1694-1726 - 33 Shots
1615-1656 - 42 Shots
1569-1590 - 22 Shots
1461-1524 - 64 Shots
1419-1440 - 22 Shots
1329-1350 - 22 Shots
1253-1274 - 22 Shots
1216-1236 - 21 Shots
1146-1200 - 55 Shots
1071-1114 - 44 Shots

No. 2 Short String

947-990 - 44 Shots
914-935 - 22 Shots
874-906 - 33 Shots

Drilling Water Production

II B-3 DRILLING WATER PRODUCTION DATA

During the drilling of wells and coreholes on and adjacent to Tract C-b, records were kept of drilling water production data. The records included produced water temperature and specific conductivity as well as produced and injected water volumes. Such readings were taken at approximately 30 foot intervals.

Drilling water production data for well AT-1 in tabular form was inadvertently left out of Quarterly Report #2, although the graphic data for AT-1 was included as page II B-16. The previously omitted tabular data is included in this report on the following pages (Table II B-2)

Production Data was included in Quarterly Report #1 for the following wells:

1) AT-1
2) AT-1a
3) AT-1a1
4) AT-1b
5) AT-1c
6) AT-1d
7) SG-6
8) SG-8
9) SG-9
10) SG-10
11) SG-10a
12) SG-11
13) SG-18
14) SG-18a
15) SG-19
16) Cb-2b

Production data was included in the Quarterly Report #2 for the following wells:

1) AT-1 (graphic data only)
2) SG-1
3) SG-1a
4) SG-17
5) SG-20
6) SG-21

TABLE II B-2 AT-1

WATER PRODUCTION AND CONDUCTIVITY DATA SHEET

OPERATOR Arco WELL NAME & NUMBER AT-1 LOCATION C-b

DATE	TIME	DEPTH	WATER TEMPERATURE	CONDUCTIVITY MICROMHOS	INJECTED WATER (rate - glm)	FLUME SIZE	FLUME READING	PRODUCTION RATE (gpm)	Air Press REMARKS
1975 1-23	1559	1340	18°C	1150	7.7	6"	.68	503	200
1-23	1627	1350	18°	1000	7.7		.67	494	200
1-23	1845	1360	18.5°	1000	7.7		.68	503	200
1-23	1922	1370	18.5°	1000	7.7		.69	516	200
1-23	2057	1380	17°	850	7.7		.69	516	200
1-23	2221	1390	18°	650	7.7		.64	458	200
1-24	00:06	1400	17°	950	7.7		.70	525	200
1-24	00:34	1410	18°	900	7.7		.68	503	200
1-24	1:09	1420	18°	900	7.7		.67	494	200
1-24	2:25	1430	18.5°	900	7.7	6"	.68	503	200
1-27	00:42	1430	8°	850		6"	.22	85	200
1-27	01:40	1440	11°	800			.26	112	200
1-27	02:25	1450	13°	750	900		.09	422	200
1-27	03:19	1460	14°	1000			.22	85	200
1-27	03:35	1470	14°	850			.22	85	200
1-27	04:28	1480	18°	800			.18	63	200
1-27	05:23	1490	20°	909			.27	116	200
1-27	06:02	1500	20°	750	900		.27	116	200
1-27	06:43	1510	21°	1100		6"	.20	72	200

TABLE II B-2 AT-1

WATER PRODUCTION AND CONDUCTIVITY DATA SHEET

OPERATOR Arco WELL NAME & NUMBER AT-1 LOCATION C-b

DATE	TIME	DEPTH	WATER TEMPERATURE	CONDUCTIVITY MICROMHOS	INJECTED WATER (rate - glm)	FLUME SIZE	FLUME READING	PRODUCTION RATE (gpm)	REMARKS
1-27	07:31	1520	22°	950		6"	.28	126	220
1-27	08:07	1530	22°	1000			.28	126	220
1-27	0843	1540	22°	1000			.28	126	220
1-27	0930	1550	22°	950			.28	126	220
1-27	1007	1560	22°	900			.27	116	225
1-27	1050	1570	22°	950			.27	116	225
1-27	1120	1580	22°	950			.28	126	225
1-27	1240	1590	22°	950			.29	130	225
1-27	1320	1600	22°	900			.26	112	225
1-27	1415	1610	22°	1100			.28	126	225
1-27	1435	1620	22°	1100			.28	126	225
1-27	1510	1630	22°	1050			.28	126	225
1-27	1555	1640	22°	1050			.29	130	225
1-27	1635	1650	22.5°	1050			.30	139	225
1-27	1700	1660	22.5°	1100			.26	112	225
1-27	1802	1670	22.5°	1150			.26	112	225
1-27	1842	1680	22.5°	1000			.26	112	225
1-27	1920	1690	22.5°	1000			.28	126	225
1-27	2000	1700	22.5°	1000			.26	112	225
						6"			

TABLE II AT-1

Jetting Test For 2 Hours & 30 min @ 1700'

WATER PRODUCTION AND CONDUCTIVITY DATA SHEET

OPERATOR Arco WELL NAME & NUMBER AT-1 LOCATION C-b

Started Test 23:15

DATE	TIME	DEPTH	WATER TEMPERATURE	CONDUCTIVITY MICROMHOS	INJECTED WATER (rate - glm)	FLUME SIZE	FLUME READING	PRODUCTION RATE (gpm)	REMARKS
1-27	23:25		23°	1400		6"	.30		
	23:35		24.5°	1500			.27		
	23:45		24.5°	1500			.23		
	23:55		24.5°	1500			.22		
1-28	00:05		24.5°	1500			.22		
	00:15		24.5°	1500			.22		
	00:25		24.5°	1500			.22		
	00:35		24.5°	1500			.22		
	00:45		24.5°	1500			.22		
	00:55		24.5°	1500			.22		
	01:05		24.5°	1500			.22		
	01:15		24.5°	1500		6"	.22	85	

II B-4 WATER QUALITY-DRILLING WATER

Most of the drilling on Tract C-b has already been completed. As a result, most of the drilling-water analyses were reported in either Quarterly Report #1 or Quarterly Report #2. One analysis was received too late for inclusion in Quarterly Report #2 and is included here. This analysis covers a sample obtained during a jetting test at 2405 feet in Well SG-17.

TABLE II B-3
GROUNDWATER ANALYSIS
JETTING TEST SG-17

Well Number: SG-17
Location: SW¼ Sec. 16 T3S R96W
Depth: 2405'
Elevation: 7036'

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	1-9-75				
1. Aluminum					
2. Ammonia (Nitrogen)					
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	2416				
7. Bismuth					
8. Boron	89				
9. Cadmium					
10. Calcium	7.2				
11. Carbonate	42.				
12. Cerium					
13. Chloride	530				
14. Chrome, Hexavalent					
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	4600				
17. Copper					
18. Fluoride	21				
19. Gallium					
20. Hardness (mg/l $CaCO_3$)	3.8				
21. Hydroxide					
22. Iron					
23. Lead	<.05				
24. Lithium	3.7				
25. Magnesium					
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	2.8				
31. pH	8.6				
32. Phosphate, Total	2.9				
33. Potassium	8.0				
34. Selenium					
35. Silica	13				
36. Sodium	1307				
37. Solids, Dissolved	3221				
38. Strontium					
39. Sulfate	12				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

M. W. Legatski

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-61

FROM:	F. C. Haas	**DATE:**	March 27, 1975
		FILE NO.:	
TO:	File	**SUBJECT:**	Water Analysis on Sample from Jetting Test, SG-17, 2405 Feet.

Project No. 197

A water sample from a jetting test at 2405 feet in core hole SG-17 was analysed for major constituents. Analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Results are attached.

FCH

FCH/br

MTA

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
T. H. Cleveland
A. W. Schillinger
M. W. Legatski
D. B. Tait
J. R. Matis

TABLE 1

MAJOR CONSTITUENT ANALYSES, SG-17, JETTING TEST, 2405'

Component, mg/l	Industrial	TOSCO
Na	1250	1307
K	NA	8.0
Ca	12	7.2
Mg	1.8	3.7
SO_4	<4	12
CO_3	66	42
HCO_3	2390	2416
Cl	500	530
F	4.8	21
Li	NA	4
BO_2	NA	89
Σ Cations, meq/l	55.10	58.27
Σ Anions, meq/l	55.72	59.36
% Difference	0.6	0.9
SiO_2, mg/l	12	13
pH	8.4	8.6
Calculated TDS, mg/l	3018	3221
Conductivity, μ mhos/cm	NA	4600

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202
Attn: John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7356

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Jetting Test 1/9/75 2400 SG-17

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	12	0.599
Magnesium	1.8	0.148
Sodium	1,250	54.810
Carbonate	66	2.198
Bicarbonate	2,390	39.172
Chloride	500	14.105
Sulfate	Less than 4.0	---
Nitrate	2.8	---
Phosphate	2.9	---
Silicon dioxide	12	0.400
Iron	Less than 0.05	---
Fluoride	4.8	0.252
P. alkalinity, in terms of calcium carbonate	54	
MO alkalinity, in terms of calcium carbonate	1,960	
Hardness, in terms of calcium carbonate	3.8	
Total dissolved solids (calculated)	3,110	

pH 8.5

MBERS OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Ochs
CHEMIST

S REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

Water Quality - Baseline

II B-5 GROUNDWATER QUALITY - BASELINE MONITORING

This report contains analytical data from the second semi-annual baseline water quality run, for most alluvial wells, all aquifer monitoring wells, and the pre-leasing "C-b" wells. Summaries of the data appear in Tables II B-4 through II B-38.

The second baseline water quality sampling run did not include Alluvial Wells A-3 and A-6. A sample was not collected from Alluvial Well A-3 because the small pump used malfunctioned. Also, during this time the stream flow in Piceance Creek made Alluvial Well A-6 inaccessible.

Information pertaining to the swabbing activities while collecting the water for analysis is presented in Table II B-39 at Page II B-60.

A sample of organic material was taken from Corehole SG-8 when the semi-annual water sample was collected. This material has been analyzed but the origin of the material is unknown. Further field investigations are required. See Laboratory Data Letter 75-109, Page II B-131 ff.

TABLE II B-4
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 1
Location: SW¼ Sec. 25 T2S R97W

Depth: 112
Elevation: 6200' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-9-74	4-23-75			
1. Aluminum	.32	.06			
2. Ammonia (Nitrogen)	<.1	.3			
3. Arsenic	.005	≤.002			
4. Barium	0.2	.04			
5. Beryllium	<.001	≤.002			
6. Bicarbonate	663	520			
7. Bismuth	<.005	≤.002			
8. Boron	.6	.19			
9. Cadmium	.01	≤.002			
10. Calcium	80	66			
11. Carbonate	<.1	<.1			
12. Cerium	.02	≤.002			
13. Chloride	15	13			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.02	≤.002			
16. Conductivity, Specific (μ℧/cc)	1790	1750			
17. Copper	.05	.01			
18. Fluoride	3.4	1.2			
19. Gallium	<.005	≤.002			
20. Hardness (mg/1 $CaCO_3$)	530	520			
21. Hydroxide	<.1	<.1			
22. Iron	9.4	<.05			
23. Lead	.03	≤.01			
24. Lithium	.4	<1.0			
25. Magnesium	80	86			
26. Manganese	.96	.03			
27. Mercury	.0003	.0002			
28. Molybdenum	.02	.04			
29. Nickel	.05	.008			
30. Nitrate	.3	<.1			
31. pH	7.8	7.9			
32. Phosphate, Total	<.1	<.1			
33. Potassium	--	2			
34. Selenium	<.005	.004			
35. Silica	17	26			
36. Sodium	270	240			
37. Solids, Dissolved	1330	1190			
38. Strontium	1	.4			
39. Sulfate	530	500			
40. Titanium	1	.02			
41. Vanadium	.02	≤.002			
42. Yttrium	<.005	≤.002			
43. Zinc	.5	.2			
44. Zirconium	<.005	.02			
45. Radioactivity					
Gross Alpha (pcl)	4.3	2.0			
Radium 226*	0.2				
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	7	8			
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-5
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 2
Location: NE¼ Sec. 35 T2S R97W

Depth: 82'
Elevation: 6200' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-9-74	4-14-75			
1. Aluminum	.34	3			
2. Ammonia (Nitrogen)	.6	1.1			
3. Arsenic	.01	.002			
4. Barium	.1	.2			
5. Beryllium	<.001	≤.002			
6. Bicarbonate	586	530			
7. Bismuth	<.003	≤.002			
8. Boron	1.7	<0.1			
9. Cadmium	.12	≤ .002			
10. Calcium	52	48			
11. Carbonate	<.1	24			
12. Cerium	.01	≤ .002			
13. Chloride	10	<1.0			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.05	≤.007			
16. Conductivity, Specific (μ℧/cc)	1240	1260			
17. Copper	.03	.02			
18. Fluoride	5	2.0			
19. Gallium	.01	≤.002			
20. Hardness (mg/1 $CaCO_3$)	395	425			
21. Hydroxide	<.1	<.1			
22. Iron	3.5	<.05			
23. Lead	.03	.02			
24. Lithium	.3	<1.0			
25. Magnesium	65	73			
26. Manganese	1.5	.2			
27. Mercury	.0002	<.0002			
28. Molybdenum	.005	.02			
29. Nickel	.05	.01			
30. Nitrate	.6	.9			
31. pH	7.4	8.2			
32. Phosphate, Total	1.1	<.1			
33. Potassium	---	1			
34. Selenium	<.003	≤.002			
35. Silica	22	39			
36. Sodium	255	170			
37. Solids, Dissolved	1110	840			
38. Strontium	2	10			
39. Sulfate	415	225			
40. Titanium	.4	.07			
41. Vanadium	.02	.002			
42. Yttrium	.003	≤.002			
43. Zinc	.05	1			
44. Zirconium	<.005	≤.002			
45. Radioactivity					
Gross Alpha (pcl)	2.3	6.3			
Radium 226*		0			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	7	2			
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-6
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 5
Location: NE¼ Sec. 36 T2S R97W

Depth: 86'
Elevation: 6257' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-9-74	4-23-75			
1. Aluminum	.06	.01			
2. Ammonia (Nitrogen)	.1	.68			
3. Arsenic	.05	.003			
4. Barium	.6	.02			
5. Beryllium	<.01	≤.002			
6. Bicarbonate	516	610			
7. Bismuth	<.01	≤.002			
8. Boron	1.2	.25			
9. Cadmium	<.001	≤.002			
10. Calcium	36	76			
11. Carbonate	<.1	12			
12. Cerium	.007	≤.002			
13. Chloride	15	13			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.04	≤.002			
16. Conductivity, Specific (µ℧/cc)	1480	1390			
17. Copper	.1	≤.01			
18. Fluoride	1.5	.5			
19. Gallium	.03	≤.002			
20. Hardness (mg/1 $CaCO_3$)	352	500			
21. Hydroxide	<.1	<.1			
22. Iron	.05	<.05			
23. Lead	<.001	.01			
24. Lithium	.5	<1.0			
25. Magnesium	64	56			
26. Manganese	2.3	.01			
27. Mercury	.0001	<.001			
28. Molybdenum	.02	.01			
29. Nickel	.09	.004			
30. Nitrate	2.2	1.5			
31. pH	7.8	8.1			
32. Phosphate, Total	.2	<.1			
33. Potassium	--	2.1			
34. Selenium	.06	≤.002			
35. Silica	17	25			
36. Sodium	290	185			
37. Solids, Dissolved	1215	990			
38. Strontium	4	1			
39. Sulfate	500	290			
40. Titanium	1	.03			
41. Vanadium	.03	.005			
42. Yttrium	.004	≤.002			
43. Zinc	1	.7			
44. Zirconium	.01	≤.002			
45. Radioactivity					
Gross Alpha (pcl)	0	6.2			
Radium 226*	-				
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	7	3			
If TOC >10 mg/1 then measure Dissolved Organic Carbon		5			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-7
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 7
Location: NW¼ Sec. 5 T3S R96W

Depth: 51'
Elevation: 6282' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-8-74	4-23-75			
1. Aluminum	.05	.1			
2. Ammonia (Nitrogen)	.1	5.2			
3. Arsenic	.004	≤ .002			
4. Barium	.03	.04			
5. Beryllium	<.003	≤.002			
6. Bicarbonate	670	470			
7. Bismuth	<.003	≤.002			
8. Boron	1.4	.25			
9. Cadmium	<.003	≤.002			
10. Calcium	30	62			
11. Carbonate	<.1	6			
12. Cerium	.01	≤.002			
13. Chloride	17	31			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.004	≤.002			
16. Conductivity, Specific (μ℧/cc)	1540	1170			
17. Copper	.09	.005			
18. Fluoride	1.9	.2			
19. Gallium	<.003	≤.002			
20. Hardness (mg/1 CaCO$_3$)	360	350			
21. Hydroxide	<.1	<.1			
22. Iron	<.05	<.05			
23. Lead	.01	≤.01			
24. Lithium	.5	<1.0			
25. Magnesium	70	47			
26. Manganese	.12	.003			
27. Mercury	.0017	.048			
28. Molybdenum	<.003	.09			
29. Nickel	.02	.003			
30. Nitrate	3.5	1.5			
31. pH	7.4	8.3			
32. Phosphate, Total	0.3	<.1			
33. Potassium	--	1			
34. Selenium	<.003	≤.002			
35. Silica	20	22			
36. Sodium	295	170			
37. Solids, Dissolved	1170	828			
38. Strontium	3	1			
39. Sulfate	405	255			
40. Titanium	.08	.03			
41. Vanadium	.002	.003			
42. Yttrium	.001	≤.002			
43. Zinc	.2	.03			
44. Zirconium	<.003	.04			
45. Radioactivity					
Gross Alpha (pcl)	2.9	4.0			
Radium 226*					
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	7	9			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-8
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 8
Location: NE¼ Sec. 5 T3S R96W

Depth: 70'
Elevation: 6330' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	10-9-74	4-23-75			
1. Aluminum	.05	.1			
2. Ammonia (Nitrogen)	.1	2.7			
3. Arsenic	.004	≤.002			
4. Barium	.04	.04			
5. Beryllium	<.008	≤.002			
6. Bicarbonate	630	464			
7. Bismuth	<.008	≤.002			
8. Boron	.7	.17			
9. Cadmium	.001	≤.002			
10. Calcium	56	56			
11. Carbonate	.1	12			
12. Cerium	.006	≤.002			
13. Chloride	3.5	5			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.002	≤.006			
16. Conductivity, Specific (μ℧/cc)	1400	1125			
17. Copper	.07	.02			
18. Fluoride	.8	.2			
19. Gallium	.007	≤.002			
20. Hardness (mg/l $CaCO_3$)	386	470			
21. Hydroxide	<.1	<.1			
22. Iron	<.05	<.05			
23. Lead	.07	.02			
24. Lithium	5	<1.0			
25. Magnesium	60	91			
26. Manganese	2.1	.006			
27. Mercury	.0012	.0013			
28. Molybdenum	.04	.1			
29. Nickel	.01	.02			
30. Nitrate	3.5	5.2			
31. pH	7.6	8.5			
32. Phosphate, Total	.1	.1			
33. Potassium	--	2			
34. Selenium	<.008	.004			
35. Silica	16	15			
36. Sodium	290	180			
37. Solids, Dissolved	1218	884			
38. Strontium	3	2			
39. Sulfate	480	354			
40. Titanium	.2	2			
41. Vanadium	.01	.005			
42. Yttrium	<.008	≤.002			
43. Zinc	.5	.3			
44. Zirconium	<.008	.02			
45. Radioactivity					
Gross Alpha (pcl)	1.5	9.6			
Radium 226*					
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon	8	9			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-9
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 9
Location: SE¼ Sec. 11 T3S R97W

Depth: 57'
Elevation: 6481 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	10-9-74	4-23-75			
1. Aluminum	.05	.1			
2. Ammonia (Nitrogen)	.2	2.7			
3. Arsenic	<.008	.003			
4. Barium	.2	.02			
5. Beryllium	.001	≤.002			
6. Bicarbonate	450	440			
7. Bismuth	<.002	≤.002			
8. Boron	.7	.18			
9. Cadmium	<.002	≤.002			
10. Calcium	49	41			
11. Carbonate	0	12			
12. Cerium	.002	≤.002			
13. Chloride	3.5	5.7			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.02	≤.002			
16. Conductivity, Specific (μ℧/cc)	1080	1100			
17. Copper	.01	.005			
18. Fluoride	.8	.2			
19. Gallium	.004	≤.005			
20. Hardness (mg/l $CaCO_3$)	358	375			
21. Hydroxide	<.1	<.1			
22. Iron	<.05	.14			
23. Lead	.05	.01			
24. Lithium	<.5	<1.0			
25. Magnesium	57	84			
26. Manganese	.7	.007			
27. Mercury	.0001	.043			
28. Molybdenum	.02	.02			
29. Nickel	.04	.004			
30. Nitrate	6.6	4.6			
31. pH	7.4	8.2			
32. Phosphate, Total	<.1	<.1			
33. Potassium	--	4.3			
34. Selenium	<.002	≤.002			
35. Silica	14	21			
36. Sodium	150	110			
37. Solids, Dissolved	861	884			
38. Strontium	2	1			
39. Sulfate	360	280			
40. Titanium	.3	.03			
41. Vanadium	.02	.005			
42. Yttrium	.002	≤.002			
43. Zinc	.1	.4			
44. Zirconium	<.01	≤.002			
45. Radioactivity					
Gross Alpha (pcl)	0	6.2			
Radium 226*					
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	6	2			
If TOC >10 mg/l then measure					
Dissolved Organic Carbon		2			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-11
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 10
Location: NW¼ Sec. 16 T3S R96W

Depth: 67'
Elevation: 6542' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-8-74	4-23-75			
1. Aluminum	.25	.3			
2. Ammonia (Nitrogen)	.1	.14			
3. Arsenic	.001	.003			
4. Barium	.05	.02			
5. Beryllium	<.001	≤.002			
6. Bicarbonate	436	464			
7. Bismuth	<.002	≤.002			
8. Boron	.7	.17			
9. Cadmium	.002	≤.002			
10. Calcium	69	48			
11. Carbonate	<.1	1			
12. Cerium	.003	≤.002			
13. Chloride	4.8	4			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.003	≤.002			
16. Conductivity, Specific (μ℧/cc)	1270	1225			
17. Copper	.03	.01			
18. Fluoride	.8	.20			
19. Gallium	<.002	≤.002			
20. Hardness (mg/1 $CaCO_3$)	498	500			
21. Hydroxide	<.1	<.1			
22. Iron	.17	<.05			
23. Lead	.05	.03			
24. Lithium	<.5	<1.0			
25. Magnesium	79	98			
26. Manganese	.92	.01			
27. Mercury	.0001	.0032			
28. Molybdenum	.02	.05			
29. Nickel	.02	.02			
30. Nitrate	9.1	0.6			
31. pH	8.0	8.2			
32. Phosphate, Total	<.1	<.1			
33. Potassium	---	2			
34. Selenium	<.002	≤.007			
35. Silica	14	15			
36. Sodium	160	113			
37. Solids, Dissolved	1000	937			
38. Strontium	.7	2			
39. Sulfate	450	428			
40. Titanium	.1	.08			
41. Vanadium	.009	.003			
42. Yttrium	.002	≤.002			
43. Zinc	.05	2			
44. Zirconium	.002	.004			
45. Radioactivity					
Gross Alpha (pcl)	2.3	9.3			
Radium 226*					
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	3	7			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-11
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 11
Location: NE¼ Sec. 8 T3S R96W

Depth: 66'
Elevation: 6436' G.L.

		DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED		10-9-74	4-23-75			
1.	Aluminum	.52	.1			
2.	Ammonia (Nitrogen)	.1	.41			
3.	Arsenic	.009	.003			
4.	Barium	.1	.03			
5.	Beryllium	<.02	≤.002			
6.	Bicarbonate	475	488			
7.	Bismuth	<.02	≤.002			
8.	Boron	.6	.4			
9.	Cadmium	<.002	≤.002			
10.	Calcium	61	50			
11.	Carbonate	<.1	6			
12.	Cerium	.01	≤.002			
13.	Chloride	4.2	6			
14.	Chrome, Hexavalent	<.01	<.01			
15.	Cobalt	.02	≤.002			
16.	Conductivity, Specific (μ℧/cc)	1480	1325			
17.	Copper	.2	.02			
18.	Fluoride	.5	.2			
19.	Gallium	<.02	≤.002			
20.	Hardness (mg/1 $CaCO_3$)	502	545			
21.	Hydroxide	<.1	<.1			
22.	Iron	1.3	.05			
23.	Lead	.2	≤.01			
24.	Lithium	<.5	<1.0			
25.	Magnesium	85	105			
26.	Manganese	.52	.03			
27.	Mercury	.0003	.0011			
28.	Molybdenum	.02	.02			
29.	Nickel	.1	.009			
30.	Nitrate	3.1	1.4			
31.	pH	7.4	8.4			
32.	Phosphate, Total	<.1	<.1			
33.	Potassium	--	2			
34.	Selenium	<.02	≤.002			
35.	Silica	14	13			
36.	Sodium	185	140			
37.	Solids, Dissolved	1062	1006			
38.	Strontium	3	3			
39.	Sulfate	475	444			
40.	Titanium	2	.03			
41.	Vanadium	.2	.006			
42.	Yttrium	<.02	≤.002			
43.	Zinc	.4	.07			
44.	Zirconium	<.02	≤.002			
45.	Radioactivity					
	Gross Alpha (pcl)	5.0	7.1			
	Radium 226*	0				
	Gross Beta (pcl)	0	0			
	Thorium 230**					
	Uranium **					
46.	Total Organic Carbon (TOC)	3	1			
	If TOC >10 mg/1 then measure Dissolved Organic Carbon		1			
	Suspended Organic Carbon					
	Phenols					
	Sulfate, Acid Extraction					
	Nitrogen, Base Extraction					
	Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-12
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Alluvial - 12 Depth: 78'
Location: Elevation: 6612' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	10-9-74	4-23-75			
1. Aluminum	.17	.1			
2. Ammonia (Nitrogen)	.1	1.1			
3. Arsenic	.008	≤.002			
4. Barium	.04	.02			
5. Beryllium	<.02	≤.002			
6. Bicarbonate	585	490			
7. Bismuth	<.02	≤.002			
8. Boron	1.2	5.2			
9. Cadmium	<.002	≤.002			
10. Calcium	105	25			
11. Carbonate	<.1	<.1			
12. Cerium	<.02	≤.002			
13. Chloride	3.5	32			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.009	≤.002			
16. Conductivity, Specific (µ℧/cc)	1510	1440			
17. Copper	.03	.005			
18. Fluoride	.7	1.7			
19. Gallium	<.02	≤.002			
20. Hardness (mg/1 $CaCO_3$)	478	560			
21. Hydroxide	<.1	<.1			
22. Iron	2.8	<.05			
23. Lead	.05	.01			
24. Lithium	<.5	<1.0			
25. Magnesium	53	120			
26. Manganese	.09	.003			
27. Mercury	.0002	.0024			
28. Molybdenum	<.02	.02			
29. Nickel	.02	.01			
30. Nitrate	2.9	.93			
31. pH	7.3	8.0			
32. Phosphate, Total	<.1	<.1			
33. Potassium	--	1.5			
34. Selenium	<.02	≤.002			
35. Silica	15	19			
36. Sodium	730	200			
37. Solids, Dissolved	1179	1159			
38. Strontium	3	1			
39. Sulfate	480	500			
40. Titanium	.4	.01			
41. Vanadium	.01	≤.002			
42. Yttrium	.007	≤.002			
43. Zinc	.5	.3			
44. Zirconium	<.02	≤.002			
45. Radioactivity					
Gross Alpha (pcl)	1.6	4.3			
Radium 226*					
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure	3	7			
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-13
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: AT-1c, String #1
Location: SW¼ Sec. 7 T3S R96W
Depth: 1550'-1640'
Elevation: 6905 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-17-74	4-17-74			
1. Aluminum	.9	.08			
2. Ammonia (Nitrogen)	.12	1.0			
3. Arsenic	.03	.003			
4. Barium	.04	.3			
5. Beryllium	<.001	<.001			
6. Bicarbonate	180	780			
7. Bismuth	<.003	.002			
8. Boron	1.1	.43			
9. Cadmium	.003	<.001			
10. Calcium	3.7	4			
11. Carbonate	160	30			
12. Cerium	<.003	<.001			
13. Chloride	36	4			
14. Chrome, Hexavalent	.003	<.01			
15. Cobalt	.006	.004			
16. Conductivity, Specific (μ℧/cc)	1420	1150			
17. Copper	.1	.03			
18. Fluoride	10	19			
19. Gallium	.002	<.001			
20. Hardness (mg/1 $CaCO_3$)	26	80			
21. Hydroxide	<.1	<.1			
22. Iron	.2	<.05			
23. Lead	.02	.01			
24. Lithium	5	<.5			
25. Magnesium	4.1	14			
26. Manganese	.06	.04			
27. Mercury	.0019	<.001			
28. Molybdenum	.07	.03			
29. Nickel	.02	<.001			
30. Nitrate	<.1	<.1			
31. pH	9.0	9.0			
32. Phosphate, Total	.1	<.1			
33. Potassium	-	7			
34. Selenium	<.003	.002			
35. Silica	12	10			
36. Sodium	520	310			
37. Solids, Dissolved	1224	800			
38. Strontium	.4	1			
39. Sulfate	96	17			
40. Titanium	.08	.08			
41. Vanadium	.003	≤.001			
42. Yttrium	<.003	≤.001			
43. Zinc	.2	.7			
44. Zirconium	.004	.001			
45. Radioactivity					
Gross Alpha (pcl)	4	4			
Radium 226*		.7			
Gross Beta (pcl)	41	11			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	<1	<4 <5			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-14
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: AT-1c, String #2
Location: SW¼ Sec. 7 T3S R96W

Depth: 1430'-1500'
Elevation: 6905' G.L.

DATE ON WHICH SAMPLE TAKEN

· ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	11-7-74	4-17-75			
1. Aluminum	.5	.4			
2. Ammonia (Nitrogen)	.17	.4			
3. Arsenic	.05	.01			
4. Barium	.1	.2			
5. Beryllium	.002	<.001			
6. Bicarbonate	465	738			
7. Bismuth	<.008	≤.001			
8. Boron	1.4	.64			
9. Cadmium	<.008	<.001			
10. Calcium	37	7			
11. Carbonate	<.1	18			
12. Cerium	<.008	<.001			
13. Chloride	3	3			
14. Chrome, Hexavalent	.005	<.01			
15. Cobalt	.003	.001			
16. Conductivity, Specific (µ℧/cc)	1350	1150			
17. Copper	.03	.02			
18. Fluoride	8.8	16			
19. Gallium	<.008	≤.001			
20. Hardness (mg/l $CaCO_3$)	200	32			
21. Hydroxide	<.1	<.1			
22. Iron	.18	<.05			
23. Lead	.03	.02			
24. Lithium	4	<.5			
25. Magnesium	27	8			
26. Manganese	.2	.3			
27. Mercury	.0009	<.001			
28. Molybdenum	.1	.08			
29. Nickel	.006	.001			
30. Nitrate	<.1	<.1			
31. pH	7.9	8.8			
32. Phosphate, Total	<.1	<.1			
33. Potassium	6.4	3			
34. Selenium	<.008	.003			
35. Silica	15	19			
36. Sodium	220	313			
37. Solids, Dissolved	810	765			
38. Strontium	5	1			
39. Sulfate	230	14			
40. Titanium	.1	.03			
41. Vanadium	.002	.001			
42. Yttrium	<.008	≤.001			
43. Zinc	.05	.05			
44. Zirconium	<.008	.01			
45. Radioactivity					
Gross Alpha (pcl)	1.6	7.2			
Radium 226*		.1			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure	<1	2			
Dissolved Organic Carbon		2			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-15
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: AT-1c, String #3
Location: SW¼ Sec. 7 T3S R96W

Depth: 60'-1340'
Elevation: 6905' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-7-74	4-17-75			
1. Aluminum	.9	.08			
2. Ammonia (Nitrogen)	.23	1.1			
3. Arsenic	.06	.02			
4. Barium	.02	.06			
5. Beryllium	<.002	<.001			
6. Bicarbonate	452	464			
7. Bismuth	<.002	<.001			
8. Boron	1.3	.16			
9. Cadmium	<.002	<.001			
10. Calcium	15	44			
11. Carbonate	9	9			
12. Cerium	<.002	<.001			
13. Chloride	7	6			
14. Chrome, Hexavalent	.006	<.01			
15. Cobalt	.002	<.001			
16. Conductivity, Specific (μ℧/cc)	1200	1250			
17. Copper	.03	.02			
18. Fluoride	6.4	4			
19. Gallium	<.002	<.001			
20. Hardness (mg/1 $CaCO_3$)	150	300			
21. Hydroxide	<.1	<.1			
22. Iron	.28	<.05			
23. Lead	.01	.01			
24. Lithium	.5	<.5			
25. Magnesium	23	45			
26. Manganese	.2	.04			
27. Mercury	.008	<.001			
28. Molybdenum	.02	.03			
29. Nickel	.01	<.001			
30. Nitrate	<.1	.5			
31. pH	8.6	8.5			
32. Phosphate, Total	<.1	<.1			
33. Potassium	3.6	4			
34. Selenium	<.002	<.004			
35. Silica	18	13			
36. Sodium	221	227			
37. Solids, Dissolved	750	883			
38. Strontium	2	3			
39. Sulfate	226	303			
40. Titanium	.08	.05			
41. Vanadium	<.001	<.001			
42. Yttrium	<.002	<.001			
43. Zinc	.03	.07			
44. Zirconium	<.002	<.001			
45. Radioactivity					
Gross Alpha (pcl)	2	7.7			
Radium 226*		0			
Gross Beta (pcl)	2	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	<1	1			
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon		1			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-16
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Cb - 1
Location: SW¼ Sec. 1 T3S R97W

Depth: 1540' - 2079'
Elevation: 6760' G.L.

ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN 11-18-74	4-12-75			
1. Aluminum	.05	.08			
2. Ammonia (Nitrogen)	2.1	3.4			
3. Arsenic	.002	.008			
4. Barium	.08	.3			
5. Beryllium	<.002	<.003			
6. Bicarbonate	2570	2706			
7. Bismuth	<.002	<.003			
8. Boron	.7	.9			
9. Cadmium	<.002	<.003			
10. Calcium	9.4	9			
11. Carbonate	<.1	43			
12. Cerium	<.002	<.003			
13. Chloride	82	27			
14. Chrome, Hexavalent	.006	<.01			
15. Cobalt	.01	.01			
16. Conductivity, Specific (μ℧/cc)	3800	3900			
17. Copper	.09	.03			
18. Fluoride	16	28			
19. Gallium	<.002	.003			
20. Hardness (mg/1 $CaCO_3$)	35	52			
21. Hydroxide	<.1	<.1			
22. Iron	.3	<.05			
23. Lead	<.008	.02			
24. Lithium	.3	<1.0			
25. Magnesium	8.2	7.2			
26. Manganese	.2	.002			
27. Mercury	-	.00009			
28. Molybdenum	.02	.07			
29. Nickel	.009	.06			
30. Nitrate	.5	.9			
31. pH	8.2	8.2			
32. Phosphate, Total	<.1	<.1			
33. Potassium	9	14			
34. Selenium	<.002	.004			
35. Silica	11	15			
36. Sodium	980	990			
37. Solids, Dissolved	2366	2350			
38. Strontium	.4	.6			
39. Sulfate	<4	12			
40. Titanium	.05	.2			
41. Vanadium	.002	.004			
42. Yttrium	<.002	<.003			
43. Zinc	.04	.004			
44. Zirconium	<.002	.004			
45. Radioactivity					
Gross Alpha (pcl)	4.3	18			
Radium 226*	0.1	.1			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	<1	6			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-17
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Cb - 2 Depth: 34'- 1320'
Location: SE¼ Sec. 6 T3S R96W Elevation: 6737' G.L.

ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	11-16-74	4-14-75			
1. Aluminum	.15	--			
2. Ammonia (Nitrogen)	.5	.5			
3. Arsenic	.02	.02			
4. Barium	.04	.1			
5. Beryllium	<.001	<.001			
6. Bicarbonate	450	550			
7. Bismuth	.005	<.001			
8. Boron	2.9	<.1			
9. Cadmium	<.002	.004			
10. Calcium	8.2	4.1			
11. Carbonate	3.6	46			
12. Cerium	<.002	<.001			
13. Chloride	9.6	11			
14. Chrome, Hexavalent	0.3	<.01			
15. Cobalt	.002	.008			
16. Conductivity, Specific (μ℧/cc)	1600	1600			
17. Copper	3	.05			
18. Fluoride	2.9	4.0			
19. Gallium	.003	<.001			
20. Hardness (mg/l $CaCO_3$)	39	24			
21. Hydroxide	<.1	<.1			
22. Iron	.5	1.2			
23. Lead	.02	.07			
24. Lithium	3	<1.0			
25. Magnesium	4.5	3.3			
26. Manganese	.1	.1			
27. Mercury	-	<.001			
28. Molybdenum	.04	.04			
29. Nickel	.02	.2			
30. Nitrate	.3	1.2			
31. pH	8.4	8.7			
32. Phosphate, Total	<.1	<.1			
33. Potassium	3.0	6			
34. Selenium	<.002	.002			
35. Silica	17	19			
36. Sodium	350	350			
37. Solids, Dissolved	976	1013			
38. Strontium	.7	.8			
39. Sulfate	360	370			
40. Titanium	.07	.03			
41. Vanadium	.002	.003			
42. Yttrium	<.002	<.001			
43. Zinc	.4	.1			
44. Zirconium	<.002	.002			
45. Radioactivity					
Gross Alpha (pcl)	1.8	12			
Radium 226*		0.0			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon	<1	4			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-18
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: Cb-4
Location: SW¼ Sec. 17 T3S R96W

Depth: open
Elevation: 7054' G.L.

ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	11-17-74	4-13-75			
1. Aluminum	e	.3			
2. Ammonia (Nitrogen)	.4	.4			
3. Arsenic	.01	.02			
4. Barium	.02	.2			
5. Beryllium	< .001	<.002			
6. Bicarbonate	360	400			
7. Bismuth	< .002	<.002			
8. Boron	2.8	.4			
9. Cadmium	< .002	.008			
10. Calcium	30	23			
11. Carbonate	< .1	12			
12. Cerium	< .002	<.002			
13. Chloride	6.9	7			
14. Chrome, Hexavalent	.03	< .01			
15. Cobalt	< .002	.006			
16. Conductivity, Specific (µ℧/cc)	840	920			
17. Copper	.5	.09			
18. Fluoride	1.0	.9			
19. Gallium	.003	≤.002			
20. Hardness (mg/1 CaCO$_3$)	180	170			
21. Hydroxide	< .1	< .1			
22. Iron	.3	< .05			
23. Lead	<.01	.02			
24. Lithium	.3	<1.0			
25. Magnesium	28	25			
26. Manganese	.1	.02			
27. Mercury		<.002			
28. Molybdenum	.02	.04			
29. Nickel	.02	.08			
30. Nitrate	.2	.4			
31. pH	7.7	8.2			
32. Phosphate, Total	<.1	.1			
33. Potassium	.4	<1.0			
34. Selenium	< .002	<.002			
35. Silica	24	32			
36. Sodium	150	146			
37. Solids, Dissolved	574	554			
38. Strontium	2	3			
39. Sulfate	160	126			
40. Titanium	.08	.3			
41. Vanadium	.001	.001			
42. Yttrium	< .002	<.002			
43. Zinc	.07	1			
44. Zirconium	< .002	<.002			
45. Radioactivity					
Gross Alpha (pcl)	1.0	16			
Radium 226*		.1			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	<1	3			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-19
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-1, String #1 Depth: 1071-1726
Location: SE¼ Sec. 2 T3S R97W Elevation: 6428 G.L.

ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	4-29-75				
1. Aluminum	--				
2. Ammonia (Nitrogen)	4.4				
3. Arsenic	.005				
4. Barium	.09				
5. Beryllium	≤.001				
6. Bicarbonate	2650				
7. Bismuth	≤.001				
8. Boron	12				
9. Cadmium	≤.001				
10. Calcium	16				
11. Carbonate	36				
12. Cerium	≤.001				
13. Chloride	270				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.001				
16. Conductivity, Specific (u℧/cc)	4600				
17. Copper	.09				
18. Fluoride	21				
19. Gallium	.002				
20. Hardness (mg/1 CaCO$_3$)	100				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.02				
24. Lithium	1.0				
25. Magnesium	15				
26. Manganese	.1				
27. Mercury	<.001				
28. Molybdenum	.1				
29. Nickel	.02				
30. Nitrate	<.1				
31. pH	8.2				
32. Phosphate, Total	<.1				
33. Potassium	29				
34. Selenium	--				
35. Silica	18				
36. Sodium	1250				
37. Solids, Dissolved	3080				
38. Strontium	.9				
39. Sulfate	125				
40. Titanium	.006				
41. Vanadium	≤.001				
42. Yttrium	≤.001				
43. Zinc	.1				
44. Zirconium	.08				
45. Radioactivity					
Gross Alpha (pcl)	23				
Radium 226*	0				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure	6				
Dissolved Organic Carbon	4				
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-20
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-1, String #2
Location: SE¼ Sec. 2 T3S R97W

Depth: 151-990
Elevation: 6428 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-30-75				
1. Aluminum	.9				
2. Ammonia (Nitrogen)	.5				
3. Arsenic	.03				
4. Barium	.04				
5. Beryllium	≤.002				
6. Bicarbonate	605				
7. Bismuth	<.002				
8. Boron	.42				
9. Cadmium	<.002				
10. Calcium	43				
11. Carbonate	12				
12. Cerium	<.002				
13. Chloride	20				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.002				
16. Conductivity, Specific (μ℧/cc)	1320				
17. Copper	.05				
18. Fluoride	3.0				
19. Gallium	<.002				
20. Hardness (mg/1 $CaCO_3$)	270				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.02				
24. Lithium	<1.0				
25. Magnesium	39				
26. Manganese	.03				
27. Mercury	<.001				
28. Molybdenum	.02				
29. Nickel	.02				
30. Nitrate	<.1				
31. pH	8.1				
32. Phosphate, Total	<.1				
33. Potassium	2.1				
34. Selenium	.004				
35. Silica	30				
36. Sodium	245				
37. Solids, Dissolved	905				
38. Strontium	2				
39. Sulfate	215				
40. Titanium	.03				
41. Vanadium	.003				
42. Yttrium	<.002				
43. Zinc	.1				
44. Zirconium	≤.002				
45. Radioactivity					
Gross Alpha (pcl)	8.1				
Radium 226*	0				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	<1				
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon	<1				
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-21
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-6, String #1 — Depth: 1625-2208
Location: SE¼ Sec. 7 T3S R96W — Elevation: 6888 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-18-75				
1. Aluminum	.5				
2. Ammonia (Nitrogen)	6.3				
3. Arsenic	.003				
4. Barium	.06				
5. Beryllium	≤.001				
6. Bicarbonate	755				
7. Bismuth	≤.001				
8. Boron	.65				
9. Cadmium	≤.001				
10. Calcium	19				
11. Carbonate	6				
12. Cerium	≤.001				
13. Chloride	220				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.001				
16. Conductivity, Specific (μ℧/cc)	2090				
17. Copper	.03				
18. Fluoride	11				
19. Gallium	.001				
20. Hardness (mg/l $CaCO_3$)	88				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.01				
24. Lithium	<1.0				
25. Magnesium	9.8				
26. Manganese	0.2				
27. Mercury	<.001				
28. Molybdenum	.01				
29. Nickel	.02				
30. Nitrate	1.6				
31. pH	8.2				
32. Phosphate, Total	<.1				
33. Potassium	40				
34. Selenium	≤.001				
35. Silica	5.3				
36. Sodium	460				
37. Solids, Dissolved	1310				
38. Strontium	.7				
39. Sulfate	170				
40. Titanium	.05				
41. Vanadium	.002				
42. Yttrium	.01				
43. Zinc	.03				
44. Zirconium	.002				
45. Radioactivity					
Gross Alpha (pcl)	3.5				
Radium 226*					
Gross Beta (pcl)	12				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	6				
If TOC >10 mg/l then measure					
Dissolved Organic Carbon	7				
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-22
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-6, String #2
Location: SE¼ Sec. 7 T3S R96W

Depth: 1430-1470
Elevation: 6888 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-18-75				
1. Aluminum	2				
2. Ammonia (Nitrogen)	1.8				
3. Arsenic	.009				
4. Barium	.06				
5. Beryllium	≤.001				
6. Bicarbonate	525				
7. Bismuth	≤.001				
8. Boron	.70				
9. Cadmium	≤.001				
10. Calcium	12				
11. Carbonate	30				
12. Cerium	≤.001				
13. Chloride	64				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.001				
16. Conductivity, Specific (μ℧/cc)	1305				
17. Copper	.01				
18. Fluoride	12				
19. Gallium	≤.001				
20. Hardness (mg/l $CaCO_3$)	100				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.01				
24. Lithium	<1.0				
25. Magnesium	17				
26. Manganese	.02				
27. Mercury	<.001				
28. Molybdenum	.1				
29. Nickel	.006				
30. Nitrate	< .1				
31. pH	8.5				
32. Phosphate, Total	< .1				
33. Potassium	20				
34. Selenium	≤.001				
35. Silica	3.3				
36. Sodium	245				
37. Solids, Dissolved	755				
38. Strontium	.7				
39. Sulfate	93				
40. Titanium	.05				
41. Vanadium	≤.001				
42. Yttrium	≤.001				
43. Zinc	--				
44. Zirconium	≤.001				
45. Radioactivity					
Gross Alpha (pcl)	6				
Radium 226*	.4				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure	7				
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-23
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-6, String 3
Location: SE¼, Sec. 7 T3S R96W

Depth: 60-1193
Elevation: 6888' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-18-75				
1. Aluminum	.5				
2. Ammonia (Nitrogen)	1.8				
3. Arsenic	.009				
4. Barium	.06				
5. Beryllium	≤.001				
6. Bicarbonate	455				
7. Bismuth	≤.001				
8. Boron	.35				
9. Cadmium	≤.001				
10. Calcium	93				
11. Carbonate	12				
12. Cerium	≤.001				
13. Chloride	34				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.001				
16. Conductivity, Specific (μ℧/cc)	1580				
17. Copper	.03				
18. Fluoride	.3				
19. Gallium	≤.001				
20. Hardness (mg/l $CaCO_3$)	560				
21. Hydroxide	<.1				
22. Iron	.44				
23. Lead	.007				
24. Lithium	<1.0				
25. Magnesium	80				
26. Manganese	.2				
27. Mercury	≤.001				
28. Molybdenum	.003				
29. Nickel	.02				
30. Nitrate	0.5				
31. pH	8.3				
32. Phosphate, Total	<.1				
33. Potassium	<1.0				
34. Selenium	≤.004				
35. Silica	23				
36. Sodium	200				
37. Solids, Dissolved	1170				
38. Strontium	17				
39. Sulfate	510				
40. Titanium	.05				
41. Vanadium	.002				
42. Yttrium	≤.001				
43. Zinc	.7				
44. Zirconium	≤.001				
45. Radioactivity					
Gross Alpha (pcl)	.4				
Radium 226*					
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	9				
If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-24
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-8, String #1
Location: S½ Sec. 9 T3S R96W

Depth: 952-2608
Elevation: 6538 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	4-23-75				
1. Aluminum	.01				
2. Ammonia (Nitrogen)	1.8				
3. Arsenic	.02				
4. Barium	.4				
5. Beryllium	≤.001				
6. Bicarbonate	1200				
7. Bismuth	≤ .001				
8. Boron	1.1				
9. Cadmium	≤ .001				
10. Calcium	5.3				
11. Carbonate	33				
12. Cerium	≤ .001				
13. Chloride	2.8				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤ .001				
16. Conductivity, Specific (μ℧/cc)	1800				
17. Copper	.02				
18. Fluoride	26				
19. Gallium	.002				
20. Hardness (mg/1 $CaCO_3$)	48				
21. Hydroxide	<.01				
22. Iron	<.05				
23. Lead	.009				
24. Lithium	<1.0				
25. Magnesium	8.5				
26. Manganese	.05				
27. Mercury	<.001				
28. Molybdenum	.008				
29. Nickel	.006				
30. Nitrate	0.2				
31. pH	8.4				
32. Phosphate, Total	<.1				
33. Potassium	1.0				
34. Selenium	.003				
35. Silica	14				
36. Sodium	490				
37. Solids, Dissolved	1180				
38. Strontium	.8				
39. Sulfate	12				
40. Titanium	.01				
41. Vanadium	.001				
42. Yttrium	≤.001				
43. Zinc	.5				
44. Zirconium	.002				
45. Radioactivity					
Gross Alpha (pcl)	2.8				
Radium 226*					
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	5				
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-25
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-8, String #2 Depth: 169-952
Location: Elevation:

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	4-23-75				
1. Aluminum	.04				
2. Ammonia (Nitrogen)	1.6				
3. Arsenic	.03				
4. Barium	.6				
5. Beryllium	<.001				
6. Bicarbonate	1210				
7. Bismuth	<.001				
8. Boron	1.9				
9. Cadmium	<.001				
10. Calcium	24				
11. Carbonate	36				
12. Cerium	<.001				
13. Chloride	35				
14. Chrome, Hexavalent	<.01				
15. Cobalt	≤.001				
16. Conductivity, Specific (μ℧/cc)	2060				
17. Copper	.01				
18. Fluoride	15				
19. Gallium	.002				
20. Hardness (mg/1 $CaCO_3$)	990				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.01				
24. Lithium	<1.0				
25. Magnesium	29				
26. Manganese	.04				
27. Mercury	<.001				
28. Molybdenum	.01				
29. Nickel	.02				
30. Nitrate	.4				
31. pH	8.3				
32. Phosphate, Total	<.1				
33. Potassium	1.0				
34. Selenium	.02				
35. Silica	18				
36. Sodium	490				
37. Solids, Dissolved	1340				
38. Strontium	3				
39. Sulfate	105				
40. Titanium	.08				
41. Vanadium	≤.001				
42. Yttrium	≤.001				
43. Zinc	1				
44. Zirconium	.003				
45. Radioactivity					
Gross Alpha (pcl)	11				
Radium 226*	0				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	3				
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-26
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-9, String #1
Location: SE¼ Sec. 11 T3S, R97W

Depth: 1316-2324
Elevation: 6870' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-29-74	4-11-75			
1. Aluminum	.4	.05			
2. Ammonia (Nitrogen)	.1	6.8			
3. Arsenic	.02	.006			
4. Barium	.08	.08			
5. Beryllium	.001	<.002			
6. Bicarbonate	860	1640			
7. Bismuth	<.002	< .002			
8. Boron	4.9	4.3			
9. Cadmium	.1	<.002			
10. Calcium	19	9			
11. Carbonate	72	67			
12. Cerium	.002	<.002			
13. Chloride	44	84			
14. Chrome, Hexavalent	.006	<.01			
15. Cobalt	.002	.002			
16. Conductivity, Specific (μ℧/cc)	1500	3200			
17. Copper	.03	.009			
18. Fluoride	18	25			
19. Gallium	.003	.002			
20. Hardness (mg/1 $CaCO_3$)	78.	36			
21. Hydroxide	<.1	<.1			
22. Iron	.68	<.05			
23. Lead	.01	.01			
24. Lithium	.22	1.3			
25. Magnesium	7.5	3.3			
26. Manganese	.09	.02			
27. Mercury	--	<.001			
28. Molybdenum	.07	.04			
29. Nickel	.003	.03			
30. Nitrate	<.1	<.1			
31. pH	8.6	8.3			
32. Phosphate, Total	<.1	<.1			
33. Potassium	5.3	16			
34. Selenium	.005	<.002			
35. Silica	15	14			
36. Sodium	400	790			
37. Solids, Dissolved	1050	1850			
38. Strontium	2	.2			
39. Sulfate	51	57			
40. Titanium	.1	.3			
41. Vanadium	.002	.004			
42. Yttrium	<.002	<.002			
43. Zinc	1	.05			
44. Zirconium	<.002	.005			
45. Radioactivity					
Gross Alpha (pcl)	4.5	6.4			
Radium 226*	0	0			
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	<1	8			
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-27
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-9, String #2
Location: SE¼ Sec. 11 T3S R97W

Depth: 1054-1210
Elevation: 6870' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-29-74	4-11-75			
1. Aluminum	.7	.05			
2. Ammonia (Nitrogen)	.2	.8			
3. Arsenic	.009	.01			
4. Barium	.07	.1			
5. Beryllium	.003	<.001			
6. Bicarbonate	690	685			
7. Bismuth	<.004	<.001			
8. Boron	1.5	0.4			
9. Cadmium	<.004	<.001			
10. Calcium	117	72			
11. Carbonate	42	<.1			
12. Cerium	<.004	<.001			
13. Chloride	60	19			
14. Chrome, Hexavalent	<.01	<.01			
15. Cobalt	.01	.003			
16. Conductivity, Specific (μ℧/cc)	1640	1840			
17. Copper	.03	.05			
18. Fluoride	.2	1.3			
19. Gallium	<.004	.001			
20. Hardness (mg/1 $CaCO_3$)	570	640			
21. Hydroxide	<.1	<.1			
22. Iron	.18	<.05			
23. Lead	<.02	.02			
24. Lithium	.27	<1.0			
25. Magnesium	68	110			
26. Manganese	.4	.1			
27. Mercury	--	<.001			
28. Molybdenum	.08	.02			
29. Nickel	.02	.04			
30. Nitrate	.4	.4			
31. pH	8.8	8.0			
32. Phosphate, Total	<.1	.4			
33. Potassium	4.8	16			
34. Selenium	.009	.001			
35. Silica	22	32			
36. Sodium	310	230			
37. Solids, Dissolved	1332	1230			
38. Strontium	3	2			
39. Sulfate	375	430			
40. Titanium	.05	.03			
41. Vanadium	.004	≤.001			
42. Yttrium	<.004	<.001			
43. Zinc	.1	1			
44. Zirconium	<.004	.001			
45. Radioactivity					
Gross Alpha (pcl)	1.7	7.6			
Radium 226*		0			
Gross Beta (pcl)	15	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	8	5			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-28
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-10, String #1
Location: NE¼ Sec. 13 T3S R97W
Depth: 1425-1500
Elevation: 6950' G.L.

ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	4-11-75				
1. Aluminum					
2. Ammonia (Nitrogen)	197				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	19,370				
7. Bismuth					
8. Boron	405				
9. Cadmium					
10. Calcium	4.9				
11. Carbonate	4,120				
12. Cerium					
13. Chloride	9,640				
14. Chrome, Hexavalent	<.01				
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	46,000				
17. Copper					
18. Fluoride	.4				
19. Gallium					
20. Hardness (mg/l $CaCO_3$)	60				
21. Hydroxide	<.1				
22. Iron	3.1				
23. Lead					
24. Lithium	2.7				
25. Magnesium	12				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	.47				
31. pH	8.5				
32. Phosphate, Total	.7				
33. Potassium	26				
34. Selenium					
35. Silica	2.9				
36. Sodium	16,500				
37. Solids, Dissolved	40,820				
38. Strontium					
39. Sulfate	600				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-29
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-10A
Location: NE¼ Sec. 13 T3S R97W
Depth: 60-1333
Elevation: 6950'

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	4-11-75				
1. Aluminum					
2. Ammonia (Nitrogen)	1.7				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	310				
7. Bismuth					
8. Boron	3.2				
9. Cadmium					
10. Calcium	51				
11. Carbonate	12				
12. Cerium					
13. Chloride	7.3				
14. Chrome, Hexavalent	<.01				
15. Cobalt					
16. Conductivity, Specific (µ℧/cc)	1280				
17. Copper					
18. Fluoride	.41				
19. Gallium					
20. Hardness (mg/1 CaCO$_3$)	370				
21. Hydroxide	<.1				
22. Iron	.08				
23. Lead					
24. Lithium	<1.0				
25. Magnesium	60				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	<.1				
31. pH	8.1				
32. Phosphate, Total	<.1				
33. Potassium	<1.0				
34. Selenium					
35. Silica	27				
36. Sodium	200				
37. Solids, Dissolved	990				
38. Strontium					
39. Sulfate	480				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-30
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-11, String No. 1, Lower Aquifer Depth: 1580-2460
Location: SE¼ Sec. 7 T3S R96W Elevation: 6900' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	11/2/74	4-12-75			
1. Aluminum	0.4				
2. Ammonia (Nitrogen)	-	91			
3. Arsenic	.03				
4. Barium	5				
5. Beryllium	.002				
6. Bicarbonate	21,594	15,400			
7. Bismuth	<.006				
8. Boron	315	305			
9. Cadmium	<.006				
10. Calcium	6	12			
11. Carbonate	1962	4420			
12. Cerium	<.006				
13. Chloride	8154	8710			
14. Chrome, Hexavalent	.007	<.01			
15. Cobalt	.03				
16. Conductivity, Specific (μ℧/cc)	40,000	43,000			
17. Copper	0.2				
18. Fluoride	48	53			
19. Gallium	.02				
20. Hardness (mg/l $CaCO_3$)	48	120			
21. Hydroxide	<.1	<.1			
22. Iron	2.3	<.05			
23. Lead	.03				
24. Lithium	79	53			
25. Magnesium	14	22			
26. Manganese	.07				
27. Mercury	.0026				
28. Molybdenum	.01				
29. Nickel	--				
30. Nitrate	.1	.65			
31. pH	8.8	8.7			
32. Phosphate, Total	<.1	<.1			
33. Potassium	125	24			
34. Selenium	<.006				
35. Silica	24	48			
36. Sodium	16,367	15,000			
37. Solids, Dissolved	38,592	23,260			
38. Strontium	3				
39. Sulfate	2	630			
40. Titanium	.2				
41. Vanadium	.02				
42. Yttrium	.03				
43. Zinc	.03				
44. Zirconium	.9				
45. Radioactivity					
Gross Alpha (pcl)	43				
Radium 226*	27				
Gross Beta (pcl)	390				
Thorium 230**	0				
Uranium **	0				
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon	29				
Suspended Organic Carbon	11				
Phenols	5				
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-31
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-11, String 2
Location: SE¼ Sec. 7 T3S R96W
Depth: 1385-1435
Elevation: 6900' G.L.

ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	4-12-75				
1. Aluminum					
2. Ammonia (Nitrogen)	.54				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	695				
7. Bismuth					
8. Boron	1.1				
9. Cadmium					
10. Calcium	.1				
11. Carbonate	30				
12. Cerium					
13. Chloride	19				
14. Chrome, Hexavalent	<.01				
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	1320				
17. Copper					
18. Fluoride	16				
19. Gallium					
20. Hardness (mg/1 CaCO$_3$)	88				
21. Hydroxide					
22. Iron	< .05				
23. Lead					
24. Lithium	<1.0				
25. Magnesium	15				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	<.1				
31. pH	8.5				
32. Phosphate, Total	<.1				
33. Potassium	10				
34. Selenium					
35. Silica	14				
36. Sodium	305				
37. Solids, Dissolved	840				
38. Strontium					
39. Sulfate	78				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-32
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-11, String 3
Location: SE¼ Sec. 7 T3S R96W

Depth: 60-1290
Elevation: 6900' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-12-75				
1. Aluminum					
2. Ammonia (Nitrogen)	.68				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	730				
7. Bismuth					
8. Boron	1.5				
9. Cadmium					
10. Calcium	18				
11. Carbonate	48				
12. Cerium					
13. Chloride	53				
14. Chrome, Hexavalent	<.01				
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	1750				
17. Copper					
18. Fluoride	4.4				
19. Gallium					
20. Hardness (mg/l $CaCO_3$)	340				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead					
24. Lithium	<1.0				
25. Magnesium	72				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	<.1				
31. pH	8.7				
32. Phosphate, Total	<.1				
33. Potassium	12				
34. Selenium					
35. Silica	2.9				
36. Sodium	310				
37. Solids, Dissolved	1130				
38. Strontium					
39. Sulfate	250				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-33
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-17, String #1
Location: SW¼ Sec. 16 T3S R96W

Depth: 1292-2254
Elevation: 7036' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	4-12-75				
1. Aluminum					
2. Ammonia (Nitrogen)	100				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	12,120				
7. Bismuth					
8. Boron	205				
9. Cadmium					
10. Calcium	7.7				
11. Carbonate	2740				
12. Cerium					
13. Chloride	6570				
14. Chrome, Hexavalent	.01				
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	33,000				
17. Copper					
18. Fluoride	35				
19. Gallium					
20. Hardness (mg/1 CaCO$_3$)	130				
21. Hydroxide	<.1				
22. Iron	1.5				
23. Lead					
24. Lithium	1.9				
25. Magnesium	28				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	.47				
31. pH	8.4				
32. Phosphate, Total	<.1				
33. Potassium	17				
34. Selenium					
35. Silica	31				
36. Sodium	11,700				
37. Solids, Dissolved	27,800				
38. Strontium					
39. Sulfate	530				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
-Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-34
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG 17, String #2
Location: SW¼ Sec. 16 T3S R.96W
Depth: 63' - 1228'
Elevation: 7036'G.L.

ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	DATE ON WHICH SAMPLE TAKEN				
	4-12-75				
1. Aluminum					
2. Ammonia (Nitrogen)	7.9				
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	900				
7. Bismuth					
8. Boron	16				
9. Cadmium					
10. Calcium	9.8				
11. Carbonate	430				
12. Cerium					
13. Chloride	360				
14. Chrome, Hexavalent	<.01				
15. Cobalt					
16. Conductivity, Specific (μʊ/cc)	4600				
17. Copper					
18. Fluoride	20				
19. Gallium					
20. Hardness (mg/l $CaCO_3$)	84				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead					
24. Lithium	2.1				
25. Magnesium	14				
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	1.9				
31. pH	8.8				
32. Phosphate, Total	<.1				
33. Potassium	25				
34. Selenium					
35. Silica	40				
36. Sodium	950				
37. Solids, Dissolved	2420				
38. Strontium					
39. Sulfate	110				
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
-Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-35
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-18A
Location: SE¼ Sec. 25, T3S R97W

Depth: 1330
Elevation: 7383' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-1-74	5-3-75			
1. Aluminum	.5	.03			
2. Ammonia (Nitrogen)		.95			
3. Arsenic	.02	.006			
4. Barium	.03	.04			
5. Beryllium	<.007	<.002			
6. Bicarbonate	471	475			
7. Bismuth	<.007	<.002			
8. Boron	1.4	.70			
9. Cadmium	<.007	<.002			
10. Calcium	24	28			
11. Carbonate	0	12			
12. Cerium	<.007	<.002			
13. Chloride	3	12			
14. Chrome, Hexavalent	-	<.01			
15. Cobalt	.001	<.002			
16. Conductivity, Specific (μ℧/cc)		930			
17. Copper	.02	.01			
18. Fluoride	190	<.1			
19. Gallium	<.007	<.002			
20. Hardness (mg/1 $CaCO_3$)	-	240			
21. Hydroxide	-	<.1			
22. Iron	.02	<.05			
23. Lead	<.02	.01			
24. Lithium	.3	<1.0			
25. Magnesium	30	42			
26. Manganese	.04	.03			
27. Mercury	.0024	<.001			
28. Molybdenum	.03	.01			
29. Nickel	.005	.01			
30. Nitrate	.22	.10			
31. pH	8.2	8.3			
32. Phosphate, Total	-	.2			
33. Potassium	.4	<1.0			
34. Selenium	<.007	.004			
35. Silica	23	27			
36. Sodium	135	166			
37. Solids, Dissolved	536	650			
38. Strontium	.3	2			
39. Sulfate	84	140			
40. Titanium	.04	.03			
41. Vanadium	.001	<.002			
42. Yttrium	.007	<.002			
43. Zinc	.03	.7			
44. Zirconium	<.007	<.002			
45. Radioactivity					
Gross Alpha (pcl)	8.0	4			
Radium 226*	.1				
Gross Beta (pcl)	0	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	<1	<1			
If TOC >10 mg/1 then measure					
Dissolved Organic Carbon		<1			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-36
GROUNDWATER ANALYSIS
ENVIRONMENTAL BASELINE MONITORING

Well Number: SG-19
Location: NW¼ Sec. 5 73S R96W
Depth: 192-920
Elevation: 6370' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	11-1-74	4-13-75			
1. Aluminum	.3	.05			
2. Ammonia (Nitrogen)	.14	1.1			
3. Arsenic	<.001	.002			
4. Barium	.2	.2			
5. Beryllium	<.002	<.001			
6. Bicarbonate	1780	1900			
7. Bismuth	<.002	<.001			
8. Boron	2.0	1.6			
9. Cadmium	<.002	<.001			
10. Calcium	6.6	10.			
11. Carbonate	66	55			
12. Cerium	<.002	<.001			
13. Chloride	10	7.2			
14. Chrome, Hexavalent	.002	<.01			
15. Cobalt	<.001	<.002			
16. Conductivity, Specific (μʊ/cc)	2750	2800			
17. Copper	.08	.05			
18. Fluoride	3.1	24			
19. Gallium	.002	.001			
20. Hardness (mg/1 $CaCO_3$)	29	36			
21. Hydroxide	<.1	<.1			
22. Iron	<.05	<.05			
23. Lead	<.008	.009			
24. Lithium	.8	<1.0			
25. Magnesium	2.9	2.5			
26. Manganese	.002	.01			
27. Mercury	.0019	<.001			
28. Molybdenum	.003	.008			
29. Nickel	.002	.02			
30. Nitrate	<.1	<.1			
31. pH	8.4	8.2			
32. Phosphate, Total	<.1	<.1			
33. Potassium	-	2.1			
34. Selenium	<.002	<.001			
35. Silica	9	11			
36. Sodium	755	800			
37. Solids, Dissolved	1810	1850			
38. Strontium	.4	.4			
39. Sulfate	<4	10			
40. Titanium	.03	.1			
41. Vanadium	<.001	.005			
42. Yttrium	<.002	<.001			
43. Zinc	.05	2			
44. Zirconium	.002	.009			
45. Radioactivity					
Gross Alpha (pcl)	7.9	20			
Radium 226*	0.1	0.3			
Gross Beta (pcl)	33	0			
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure Dissolved Organic Carbon	<1	7			
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-37
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-20
Location: SE¼ Sec. 31 T2S R96W

Depth: 212-987
Elevation: 6358'

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	4-14-75				
1. Aluminum	.04				
2. Ammonia (Nitrogen)	1.4				
3. Arsenic	.004				
4. Barium	.3				
5. Beryllium	<.001				
6. Bicarbonate	1790				
7. Bismuth	<.001				
8. Boron	1.6				
9. Cadmium	<.001				
10. Calcium	7.4				
11. Carbonate	85				
12. Cerium	<.001				
13. Chloride	11				
14. Chrome, Hexavalent	<.01				
15. Cobalt	<.004				
16. Conductivity, Specific (μ℧/cc)	2900				
17. Copper	.03				
18. Fluoride	25				
19. Gallium	<.001				
20. Hardness (mg/1 $CaCO_3$)	32				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.008				
24. Lithium	<1.0				
25. Magnesium	3.3				
26. Manganese	.007				
27. Mercury	<.001				
28. Molybdenum	.03				
29. Nickel	.03				
30. Nitrate	.9				
31. pH	8.4				
32. Phosphate, Total	<.1				
33. Potassium	2.1				
34. Selenium	.002				
35. Silica	10				
36. Sodium	760				
37. Solids, Dissolved	1790				
38. Strontium	.7				
39. Sulfate	10				
40. Titanium	.2				
41. Vanadium	<.001				
42. Yttrium	<.001				
43. Zinc	.04				
44. Zirconium	.01				
45. Radioactivity					
Gross Alpha (pcl)	12				
Radium 226*	.1				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	8				
If TOC >10 mg/1 then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
-Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

TABLE II B-38
GROUNDWATER ANALYSIS
BASELINE MONITORING

Well Number: SG-21
Location: SE¼ Sec. 13 T3S R97W

Depth: 156' - 1036'
Elevation: 6811' G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	4-15-75				
1. Aluminum	.06				
2. Ammonia (Nitrogen)	0.4				
3. Arsenic	.006				
4. Barium	.1				
5. Beryllium	<.002				
6. Bicarbonate	470				
7. Bismuth	<.002				
8. Boron	0.4				
9. Cadmium	<.002				
10. Calcium	30				
11. Carbonate	24				
12. Cerium	<.002				
13. Chloride	2.9				
14. Chrome, Hexavalent	<.01				
15. Cobalt	<.003				
16. Conductivity, Specific (μ℧/cc)	1020				
17. Copper	.005				
18. Fluoride	8.6				
19. Gallium	.002				
20. Hardness (mg/l $CaCO_3$)	160				
21. Hydroxide	<.1				
22. Iron	<.05				
23. Lead	.01				
24. Lithium	<1.0				
25. Magnesium	21				
26. Manganese	.03				
27. Mercury	<.001				
28. Molybdenum	.02				
29. Nickel	.02				
30. Nitrate	0.6				
31. pH	8.2				
32. Phosphate, Total	0.2				
33. Potassium	2.1				
34. Selenium	.003				
35. Silica	21				
36. Sodium	200				
37. Solids, Dissolved	650				
38. Strontium	2				
39. Sulfate	110				
40. Titanium	.03				
41. Vanadium	.003				
42. Yttrium	<.002				
43. Zinc	.1				
44. Zirconium	<.001				
45. Radioactivity					
Gross Alpha (pcl)	9.2				
Radium 226*	.1				
Gross Beta (pcl)	0				
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC)	2				
If TOC >10 mg/l then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

AtlanticRichfieldCompany
Synthetic Crude and Minerals Division
Resource Development Group-U.S.
1500 Security Life Building
Denver, Colorado 80202
Telephone 303 266 3741

RECEIVED
MAY 22 1975
A. J. ROGERS

May 20, 1975

Mr. Donald B. Tait
Atlantic Richfield Company
1500 Security Life Building
Denver, Colorado 80202

SUBJECT: Groundwater Swabbing Activities
C-b Tract, Colorado

Dear Don:

Attached is the April 1975 summarization in table form of the groundwater environmental sampling. Included in the information is a chart containing conductivities, water levels (G.L.), field temperature, amount of water swabbed and length of time spent on each string. The initial starting date was April 8th and the project was completed on May 3rd.

As shown on the chart, several water levels are believed to be erroneous due to faulty equipment. I believe the amount of water swabbed is accurate to ± ¼ barrel per swab. All final water samples were filtered and delivered to TOSCO for analysis.

Sincerely yours,

Carl C. Moehle

Carl C. Moehle

CCM/al
Attachment: as stated

TA[illegible] II B-39

C-b TRACT

ENVIRONMENTAL SAMPLING - GROUNDWATER

APRIL 1975

Well Name and String No.	Length of Time Swabbed (hours)	Amount of Water Swabbed (bbls)	Range of Conductivity	Final Conductivity** (Sampled)	Water Level (below G. L.)	Field Temperature
SG-1, String #1	7	128	9,500-2,200	4,225	63 ft.	20°C
SG-1, String #2	4	126	1,600-1,000	1,300	63 ft.	15°C
SG-6, String #1	1	5.75	1,400-1,250	1,375	426 ft.	12°C
SG-6, String #2	1	6	1,420-1,400	1,400	438.5 ft.	11°C
SG-6, String #3	3/4	6.6	1,500-1,400	1,600	329 ft.	10°C
SG-8, String #1	8	58.5	2,000-1,400	1,800	28 ft.	16°C
SG-8, String #2	7	119	2,300-1,200	2,100	72 ft.	16°C
SG-9, String #1	6 3/4	45.5	20,000-1,800	6,500	365 ft.	21°C
SG-9, String #2	1/2	5	1,800-1,800	1,800	350 ft.	17°C
SG-10	6	158	55,000-47,000	50,000	431 ft.	24°C
SG-10A	1	64.5	1,400-1,100	1,400	*680 ft.	15.5°C
SG-11, String #1	2	36.5	47,000-43,000	45,000	231.7 ft.	17°C
SG-11, String #2	1 1/2	10.4	1,650-1,400	1,400	377 ft.	16°C
SG-11, String #3	1 1/2	5	1,830-1,800	1,800	348 ft.	15°C
SG-17, String #1	9 1/2	25.5	50,000-35,000	35,000	Flowing	16.5°C
SG-17, String #2	7 3/4	117	20,000-1,300	4,700	393 ft.	19°C
SG-18A	2	45	1,100-800	1,000	*683.2 ft.	16°C
SG-19				2,825	Flowing	11°C
SG-20				2,800	Flowing	13°C
SG-21	1	16	1,000-920	920	111.2 ft.	13.5°C
AT-1C, String #1	2	4.5	1,250-1,150	1,175	450.2 ft.	12°C
AT-1C, String #2	2	7.5	1,300-1,175	1,175	447.5 ft.	12°C
AT-1C, String #3	1	15.5	1,400-1,000	1,300	363.7 ft.	12°C
Cb-1	1 3/4	6.6	4,000-2,450	3,800	354.2 ft.	14°C
Cb-2	1	18	1,600-1,300	1,600	327 ft.	13°C
Cb-4	1/2	10.5	1,000-850	850	430 ft.	14°C

Total Hours 74 1/2 (9.3 days)

*Faulty Well Sounder
**Stabilized Value

J. R. Matis

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-110

FROM:	F. C. Haas	**DATE:**	June 19, 1975
		FILE NO.:	5100-3
TO:	File	**SUBJECT:**	Analyses of Environmental Water Samples from Alluvial Wells, C-b Tract

Project 197

Environmental water samples were taken in April, 1975 from nine alluvial wells on C-b tract. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, trace metals and total organic carbon were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity measurements were made by Hazen Research, Inc., Golden, Colorado.

There were some discrepancies for sodium, potassium and calcium in samples from wells A-1, A-8, A-9, A-10 and A-11. Industrial Laboratories, was asked to check their values and their recheck values checked with TOSCO's values.

Total organic carbon in all samples was less than 10 milligrams per liter.

Seven of the samples had gross alpha radiation above 4 pCi per liter; Ra_{226} was determined and found to be less than 4 pCi per liter.

FCH/ec
Encs.

MTA
Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

ENVIRONMENTAL WATER SAMPLES FROM ALLUVIAL WELLS
C-b Tract April, 1975
(Major Constituent Analyses)

Component	A-1		A-2		A-5		A-7		A-8		A-9		A-10		A-11		A-12	
	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO
Sodium, mg/l	225	240	170	160	185	167	170	140	93	93	110	93	90	113	170	140	200	145
Potassium, mg/l	5.5	2	3.7	1	2.1	2.7	3	1	1	2	4.3	2	1	2	2.7	2	1.5	2
Calcium, mg/l	66	69	48	44	110	76	62	71	56	84	41	45	39	48	56	50	25	50
Magnesium, mg/l	86	97	73	77	56	82	47	53	81	91	84	72	98	99	115	105	120	114
Lithium, mg/l	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5
Sulfate, mg/l	500	420	225	210	290	255	255	255	450	354	280	263	480	428	500	444	500	494
Carbonate, mg/l	<0.1	12	24	10	12	18	6	<1	6	12	12	9	<0.1	<1	18	6	<1	<1
Bicarbonate, mg/l	520	634	530	577	610	622	470	459	440	464	440	439	450	464	430	488	490	500
Chloride, mg/l	13	12	1	4	13	12	31	23	5.7	5	5.7	5	2.8	4	4.4	6	32	10
Fluoride, mg/l	1.2	0.7	2	1	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	1.7	0.2
Borate, mg/l	0.7	0.9	<0.4	0.8	1.0	0.8	1.0	0.6	0.6	0.4	0.7	0.6	0.6	0.4	1.6	0.4	20	1
∑Cations, meq/l	20.30	21.92	15.89	15.52	18.21	17.88	14.44	14.02	13.54	15.78	13.86	12.27	13.95	15.51	19.73	17.28	19.86	18.28
∑Anions, meq/l	19.39	19.94	14.28	14.35	16.86	16.47	14.11	13.51	16.95	15.52	13.63	13.11	17.46	16.64	18.19	17.62	19.92	18.80
% Difference	3.1	2.3	5.4	3.9	3.8	3.8	1.2	1.9	11.2	0.8	0.8	3.3	10.9	3.5	4.1	1.0	0.2	1.4
Conductivity, μmhos/cm	1750	1600	1260	1050	1390	1275	1170	1000	1260	1125	1100	1000	1350	1225	1460	1325	1440	1375
SiO_2 mg/l	26	15	39	30	25	20	22	15	19	15	21	16	22	15	17	13	19	15
pH	7.9	8.4	8.2	8.6	8.1	8.5	8.3	8.2	8.1	8.5	8.2	8.5	7.9	8.2	8.3	8.4	8.0	8.1
Calculated TDS, mg/l	1189	1179	844	821	994	938	828	784	928	884	775	721	954	937	1096	1006	1159	1077

THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202
Attn: John Matis

DATE RECEIVED:
DATE REPORTED: 6/17/75

LAB. NUMBER: See below

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Retests

ANALYSIS:

LAB #		RETEST	MILLIGRAMS PER LITER
9200	AT-1C #35	Bicarbonate	465
9201	A-1	Potassium	5.5
9207	A-8	Sodium	93
9210	A-9	Calcium	41
"		Sodium	110
9211	A-10	Calcium	39
"		Sodium	90
9212	SG-10 #15	Sulfate	760
"		Bicarbonate	12,400
"		Potassium	20
"		Lithium	12
"		Carbonate	5,360
9216	A-11	Calcium	56
9217	SG-11 S#1	Sulfate	800
"		Bicarbonate	14,400
"		Potassium	20
"		Carbonate	3,990
9219	SG-17 S#2	Sodium	1,200
"		Bicarbonate	1,270
"		Carbonate	340
9220	SG-17 S#1	Sulfate	705
"		Bicarbonate	9,850
"		Potassium	17
"		Lithium	6.5
"		Carbonate	2,850
9221	SG-18	Fluoride	4.0

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Ochs
CHEMIST

cc: Frank Haas

[illegible] OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

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THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3541

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9201

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

AMPLE MARKED: Aluvial #1 4/23

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	66	3.293
Magnesium	86	7.076
Sodium	225	9.787
Carbonate	Less than 0.1	---
Bicarbonate	520	8.552
Chloride	13	0.366
Sulfate	500	10.410
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	26	0.865
Iron	Less than 0.05	---
Fluoride	1.2	0.063
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	425	
Hardness, in terms of calcium carbonate	520	
Total dissolved solids (calculated)	1,190	
Potassium	14	
Lithium	Less than 1.0	
Boron	0.19	
Bexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.3	

Specific conductance
1,750 micromhos per cc

pH 7.9

MBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

RECEIVED
MAY 19 1975
TOSCO/GOLDEN

ATLANTIC RICHFIELD COMPANY
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202

Attn: John Matis

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9105

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-2 4/14/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	48	2.395
Magnesium	73	6.006
Sodium	170	7.395
Carbonate	24	0.799
Bicarbonate	530	8.686
Chloride	Less than 1.0	---
Sulfate	225	4.684
Nitrate	0.9	---
Phosphate	Less than 0.1	---
Silicon dioxide	39	1.298
Iron	Less than 0.05	
Fluoride	2.0	
P. alkalinity, in terms of calcium carbonate	20	
MO alkalinity, in terms of calcium carbonate	435	
Hardness, in terms of calcium carbonate	425	
Total dissolved solids (calculated)	840	
Potassium	3.7	
Lithium	Less than 1.0	
Boron	Less than 0.1	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.1	

pH 8.2

Specific conductance
1,260 micromhos per cc

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9202

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-5

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	110	5.489
Magnesium	56	4.607
Sodium	185	8.047
Carbonate	12	0.399
Bicarbonate	610	9.997
Chloride	13	0.366
Sulfate	290	6.037
Nitrate	1.5	0.024
Phosphate	Less than 0.1	---
Silicon dioxide	25	0.832
Iron	Less than 0.05	---
Fluoride	0.5	---
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	500	
Hardness, in terms of calcium carbonate	500	
Total dissolved solids (calculated)	990	
Potassium	2.1	
Lithium	Less than 1.0	
Boron	0.25	
Hexavlanent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.68	

Specific conductance
1,390 micromhos per cc

pH 8.1

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul [illegible]
CHEMIST

MEMBERS OF:

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INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9206

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-7

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	62	3.093
Magnesium	47	3.867
Sodium	170	7.395
Carbonate	6	0.199
Bicarbonate	470	7.703
Chloride	31	0.874
Sulfate	255	5.309
Nitrate	1.5	0.024
Phosphate	Less than 0.1	---
Silicon dioxide	22	0.732
Iron	Less than 0.05	---
Fluoride	0.2	
P. alkalinity, in terms of calcium carbonate	4.9	
MO alkalinity, in terms of calcium carbonate	385	
Hardness, in terms of calcium carbonate	350	
Total dissolved solids (calculated)	830	
Potassium	3	
Lithium	Less than 1.0	
Boron	0.25	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	5.2	

Specific conductance
1170 micromhos per cc

pH 8.3

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
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THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
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DENVER, COLORADO 80211
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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9207

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-8

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	56	2.794
Magnesium	81	6.664
Sodium	180	7.830
Carbonate	6	0.199
Bicarbonate	440	7.211
Chloride	5.7	0.160
Sulfate	450	9.369
Nitrate	5.2	0.083
Phosphate	Less than 0.1	---
Silicon dioxide	19	0.632
Iron	Less than 0.05	
Fluoride	0.2	
P. alkalinity, in terms of calcium carbonate	4.9	
MO alkalinity, in terms of calcium carbonate	360	
Hardness, in terms of calcium carbonate	470	
Total dissolved solids (calculated)	1,020	
Potassium	1.0	
Lithium	Less than 1.0	
Boron	0.17	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	2.7	

Specific conductance
1,260 micromhos per cc

pH 8.1

MEMB[illegible] OF:

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9210

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-9

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	13	0.648
Magnesium	84	6.911
Sodium	145	6.307
Carbonate	12	0.399
Bicarbonate	440	7.211
Chloride	5.7	0.160
Sulfate	280	5.829
Nitrate	4.6	---
Phosphate	Less than 0.1	---
Silicon dioxide	21	0.699
Iron	0.14	
Fluoride	0.2	
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	360	
Hardness, in terms of calcium carbonate	375	
Total dissolved solids (calculated)	785	
Potassium	4.3	
Lithium	Less than 1.0	
Boron	0.18	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonis-nitrogen	2.7	

Specific conductance
1,100 micromhos per cc

pH 8.2

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
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CHEMIST

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THE INDUSTRIAL LABORATORIES COMPANY

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9211

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-10

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	39	1.946
Magnesium	98	8.063
Sodium	180	7.830
Carbonate	Less than 0.1	---
Bicarbonate	450	7.375
Chloride	2.8	0.078
Sulfate	480	9.993
Nitrate	0.6	---
Phosphate	Less than 0.1	---
Silicon dioxide	22	0.732

Iron	Less than 0.05	Specific conductance 1,350 micromhos per cc	
Fluoride	0.20		
P. alkalinity, in terms of calcium carbonate	Less than 0.1	pH	7.9
MO alkalinity, in terms of calcium carbonate	370		
Hardness, in terms of calcium carbonate	500		
Total dissolved solids (calculated)	1,040		

Potassium	1.0
Lithium	Less than 1.0
Boron	0.17
Hexavalent chromium	Less than 0.01
Hydroxide	Less than 0.1
Ammonia-nitrogen	0.14

MEMBER OF:
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THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

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2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9216

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-11

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	11	1.397
Magnesium	115	9.462
Sodium	170	7.395
Carbonate	18	0.599
Bicarbonate	430	7.047
Chloride	4.4	0.124
Sulfate	500	10.410
Nitrate	1.4	0.022
Phosphate	Less than 0.1	----
Silicon dioxide	17	0.566
Iron	Less than 0.05	
Fluoride	0.10	
P. alkalinity, in terms of calcium carbonate	15	
MO alkalinity, in terms of calcium carbonate	390	
Hardness, in terms of calcium carbonate	545	
Total dissolved solids (calculated)	1,060	
Potassium	2.7	
Lithium	Less than 1.0	
Boron	0.40	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.41	

Specific conductance
1,460 micromhos per cc

pH 8.3

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9218

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: A-12

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	25	1.247
Magnesium	120	9.873
Sodium	200	8.700
Carbonate	Less than 0.1	---
Bicarbonate	490	8.031
Chloride	32	0.902
Sulfate	500	10.410
Nitrate	0.93	---
Phosphate	Less than 0.1	---
Silicon dioxide	19	0.632
Iron	Less than 0.05	----
Fluoride	1.7	0.089
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	510	
Hardness, in terms of calcium carbonate	560	
Total dissolved solids (calculated)	1,140	
Potassium	1.5	
Lithium	Less than 1.0	
Boron	5.2	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.1	

Specific conductance
1,440 micromhos per cc

pH 8.0

THE INDUSTRIAL LABORATORIES COMPANY
CHEMIST

EMBERS OF:

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AMERICAN CHEMICAL SOCIETY
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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: Alluvial Well #1 Environmental Sample 4-23-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	≤0.002
Thorium		Gadolinium		Molybdenum	0.04	Titanium	0.02
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	≤0.01	Samarium		Zirconium	0.02	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0002	Praseodymium		Strontium	0.4	Chlorine	**
Gold		Cerium		Rubidium	0.003	Sulfur	**
Platinum		Lanthanum		Bromine	0.03	Phosphorus	0.02
Iridium		Barium	0.04	Selenium	0.004	Silicon	**
Osmium		Cesium	0.007	Arsenic	≤0.002	Aluminum	0.06
Rhenium		Iodine	0.03	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.2	Fluorine	**
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.008	Nitrogen	NR
Ytterbium		Cadmium		Cobalt		Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.05
Erbium		Palladium		Manganese	0.03	Beryllium	
Holmium		Rhodium		Chromium	0.006	Lithium	0.03
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.002 µg/ml
*Flameless Atomic Absorption

Approved:
**Not reported upon request

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JUN 5 1975
TOSCO/GOLDE

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: A-2 10.5°C 1300 µmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.002
Thorium		Gadolinium		Molybdenum	***0.02	Titanium	0.07
Bismuth		Europium		Niobium		Scandium	≤0.004
Lead	0.02	Samarium		Zirconium	≤0.002	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00012	Praseodymium		Strontium	10	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum		Bromine	0.03	Phosphorus	0.1
Iridium		Barium	0.2	Selenium		Silicon	**
Osmium		Cesium		Arsenic	0.002	Aluminum	3
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	≤0.002	Sodium	**
Tantalum		Antimony		Zinc	1	Fluorine	**
Hafnium		Tin		Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.01	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.007	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.02
Erbium		Palladium		Manganese	0.2	Beryllium	
Holmium		Rhodium		Chromium	0.003	Lithium	0.03
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.002 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

***Heterogeneous

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
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Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-5 Environmental Sample 4-25-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.005
Thorium		Gadolinium		Molybdenum	0.01	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.01	Samarium		Zirconium	≤0.002	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00042	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.003	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.07
Iridium		Barium	0.02	Selenium		Silicon	**
Osmium		Cesium	≤0.002	Arsenic	0.003	Aluminum	0.01
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.7	Fluorine	**
Hafnium		Tin		Copper	≤0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.004	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	0.03	Boron	0.03
Erbium		Palladium		Manganese	0.01	Beryllium	
Holmium		Rhodium		Chromium	0.02	Lithium	0.04
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.002 µg/ml
*Flameless Atomic Absorption

Approved: M Jacobs

**Not reported upon request

COMMERCIAL TESTING & ENGINEERING CO.
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Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-7 Environmental Sample 4-26-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.003
Thorium		Gadolinium		Molybdenum	***0.09	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	≤0.01	Samarium		Zirconium	0.04	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.048	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.05	Phosphorus	0.03
Iridium		Barium	0.04	Selenium		Silicon	**
Osmium		Cesium	0.01	Arsenic	≤0.002	Aluminum	0.1
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.03	Fluorine	**
Hafnium		Tin		Copper	0.005	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.003	Nitrogen	NR
Ytterbium		Cadmium		Cobalt		Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.03
Erbium		Palladium		Manganese	0.003	Beryllium	
Holmium		Rhodium		Chromium	0.008	Lithium	0.06
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.002 µg/ml
*Flameless Atomic Absorption
**Not reported upon request

***Heterogeneous

Approved: M L Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

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Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-8 Environmental Sample 4-26-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.005
Thorium		Gadolinium		Molybdenum	***0.1	Titanium	***2
Bismuth		Europium		Niobium		Scandium	≤0.005
Lead	0.02	Samarium		Zirconium	0.02	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0013	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.03	Sulfur	**
Platinum		Lanthanum		Bromine	0.08	Phosphorus	0.2
Iridium		Barium	0.04	Selenium	0.004	Silicon	**
Osmium		Cesium	0.03	Arsenic	≤0.002	Aluminum	0.1
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.3	Fluorine	**
Hafnium		Tin		Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.006	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.05
Erbium		Palladium		Manganese	0.006	Beryllium	
Holmium		Rhodium		Chromium	0.01	Lithium	0.2
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported <0.002 µg/ml
*Flameless Atomic Absorption
**Not reported upon request

Approved: M Jacobs

***Heterogeneous

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 00001 · AREA CODE 312 720-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-9 Environmental Sample 4-26-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.005
Thorium		Gadolinium		Molybdenum	0.02	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.01	Samarium		Zirconium	≤0.002	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.043	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.05
Iridium		Barium	0.02	Selenium		Silicon	**
Osmium		Cesium		Arsenic	0.003	Aluminum	0.1
Rhenium		Iodine	0.006	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.4	Fluorine	**
Hafnium		Tin		Copper	0.005	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.004	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	0.1	Boron	0.006
Erbium		Palladium		Manganese	0.007	Beryllium	
Holmium		Rhodium		Chromium	0.008	Lithium	0.04
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.002 µg/ml
*Flameless Atomic Absorption
**Not reported upon request

Approved:

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-10 Environmental Sample 4-26-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.003
Thorium		Gadolinium		Molybdenum	***0.05	Titanium	0.08
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.03	Samarium		Zirconium	0.004	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0032	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.003	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.06
Iridium		Barium	0.02	Selenium	≤0.007	Silicon	**
Osmium		Cesium	0.007	Arsenic	0.003	Aluminum	0.3
Rhenium		Iodine	0.004	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	2	Fluorine	**
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	***1	Boron	0.01
Erbium		Palladium		Manganese	0.01	Beryllium	
Holmium		Rhodium		Chromium	0.003	Lithium	0.03
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.002 µg/ml
*Flameless Atomic Absorption
**Not reported upon request

***Heterogeneous

Approved: M L Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: A-11 Environmental Sample 4-25-75

IAD No.: 97-302-002-26

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.006
Thorium		Gadolinium		Molybdenum	***0.02	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.005
Lead	≤0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0011	Praseodymium		Strontium	3	Chlorine	**
Gold		Cerium		Rubidium	0.004	Sulfur	**
Platinum		Lanthanum		Bromine	0.03	Phosphorus	0.07
Iridium		Barium	0.03	Selenium		Silicon	**
Osmium		Cesium		Arsenic	0.003	Aluminum	0.1
Rhenium		Iodine		Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.07	Fluorine	**
Hafnium		Tin		Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.009	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	0.1	Boron	0.03
Erbium		Palladium		Manganese	0.03	Beryllium	
Holmium		Rhodium		Chromium	0.008	Lithium	0.03
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0. 002 μg/ml
*Flameless Atomic Absorption
**Not reported upon request

***Heterogeneous

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: A-12 Environmental Sample
4-26-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	≤0.002
Thorium		Gadolinium		Molybdenum	0.02	Titanium	0.01
Bismuth		Europium		Niobium		Scandium	0.006
Lead	0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0024	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.02
Iridium		Barium	0.02	Selenium		Silicon	**
Osmium		Cesium	0.007	Arsenic	≤0.002	Aluminum	0.1
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	≤0.002	Sodium	**
Tantalum		Antimony		Zinc	0.3	Fluorine	**
Hafnium		Tin		Copper	0.005	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.01	Nitrogen	NR
Ytterbium		Cadmium		Cobalt		Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.01
Erbium		Palladium		Manganese	0.003	Beryllium	
Holmium		Rhodium		Chromium	0.01	Lithium	0.02
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.002 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved:

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5°C, 920 μmhos, Environmental Sample 4-15-75	2		
2) SG #20 13°C, 2800 μmhos, Environmental Sample 4-14-75	8		
[illegible] SG #19 11°C, 2825 μmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 μmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 μmhos Environmental Sample 4-11-75	8		
6) Cb-4 14°C 850 μmhos Environmental Sample 4-13-75	3		
7) Cb-2 13°C 1600 μmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14°C 3800 μmhos, Environmental Sample 4-12-75	6		
✓ 9) A-2 10.5°C 1300 μmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

IAD #97-302-002-26 Con't	TOC* mg/l	DOC* mg/l	SUSP**
11) SG #10A Environmental Sample 5-3-75	<1		
12) SG #10 String #1 Environmental Sample 5-1-75	26	25	17
13) SG #11String #2 Environmental Sample 5-2-75	2	3	
14) SG #11 String #3 Environmental Sample 5-2-75	3	4	
15) SG #11 String #1 Environmental Sample 5-2-75	25	26	19
16) SG #17 String #1 Environmental Sample 4-26-75	18	20	16
17) SG #17 String #2 Environmental Sample 4-28-75	4	9	
18) SG #18 Environmental Sample 5-3-75	<1	<1	
✓19) Alluvial Well #1 Environmental Sample 4-23-75	8		
✓20) A-5 Environmental Sample 4-25-75	3	5	
✓21) A-7 Environmental Sample 4-26-75	9		
✓22) A-8 Environmental Sample 4-26-75	9		
✓23) A-9 Environmental Sample 4-26-75	2	2	
✓24) A-10 Environmental Sample 4-26-75	7		
✓25) A-11 Environmental Sample 4-26-75	1	1	
✓26) A-12 Environmental Sample 4-26-75	7		
IAD Standard 2.5 mg/l in 5% $NaHCO_3$	3		
IAD Standard 2.5 mg/l	3		
IAD Standard 50 mg/l in 5% $NaHCO_3$	50		
IAD Standard 50 mg/l	45		
IAD Standard 10 mg/l	10		
IAD Standard 20 mg/l	15		

* Test performed on samples marked "Regular" Outside lab.

* SUSP - Material remaining on glass filter was experimentally run for organic carbon.

M L Jacobs
M. L. Jacobs, Ph.D.
Divisional Manager

MLJ/dh

HAZEN RESEARCH, INC.
4601 I[illegible]ana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 16, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Analysis No.	Sample Designation	pCi/l α Total ± α Precision*	 β Total ± β Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	7.6 ± 3.8	0 ± 14
-2	SG#9-String 1-6500nmhos-Environ. Samp.-4/11	6.4 ± 4.3	0 ± 25
-3	Cb1-3800nmhos-Environ. Samp.-4/12-Fixed	18 ± 6	0 ± 23
-4	SG#19-2825nmhos-Environ. Samp.-4/13	20 ± 7	0 ± 22
-5	SG#20-2800nmhos-Environ. Samp.-4/14	12 ± 6	0 ± 21
-6	SG#21-920nmhos-Environ. Samp.-4/15	9.2 ± 3.2	0 ± 13
-7	Cb4-850nmhos-Envifon. Samp.-4/13-Fixed	16 ± 4	0 ± 13
-8 ✓	A2-1300nmhos-Environ. Samp.-4/14-Fixed	6.3 ± 3.1	0 ± 13
-9	Cb2-1600nmhos-Environ. Samp.-4/14-Raw	12 ± 4	0 ± 13

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

Note: All samples will be analyzed for Ra^{226}.

RECEIVED
MAY 19 1975
TOSCO/GOLDEN

HAZEN RESEARCH, INC.
4601 India Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	α Total	±	α Precision*	β Total	±	β Precision*
		pCi/l					
8166-1+	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+ ✓	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20 ✓	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

Mr. Frank Haas
The Oil Shale Corporation

HRI Project No. 535
HRI Series No. 8166

Analysis No.	Sample Designation	pCi/l					
		α Total	±	α Precision*	β Total	±	β Precision*
8166-21+ ✓	A-8,1300umhos,4/26	9.6	±	3.4	0	±	12
-22+ ✓	A-9,1175umhos,4/26	6.2	±	3.0	0	±	12
-23+ ✓	A-10,1500umhos,4/26	9.3	±	3.7	0	±	12
-24+ ✓	A-11,1450umhos,4/25	7.1	±	3.5	0	±	13
-25+ ✓	A-12,1600umhos,4/26	4.3	±	3.0	0	±	12
-26 ✓	Alluvial Well#1,2200umhos	2.0	±	3.1	0	±	19

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

**Note: Beta precision not valid due to very high soluble salts in the sample.

+Ra^{226} results to follow at a later date.

HAZEN RESEARCH, INC.
4601 Ind[illegible]a Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

June 6, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Addition to Report dated 5/16/75

Analysis No.	Sample Designation	pCi/1		
		Ra^{226}	±	Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	0.0	±	0.3
-2	SG#9-String 1-6500umhos-Environ. Samp.-4/11	0.0	±	0.4
-3	Cb1-3800umhos-Environ. Samp.-4/12-Fixed	0.1	±	0.4
-4	SG#19-2825umhos-Environ. Samp.-4/13	0.3	±	0.5
-5	SG#20-2800umhos-Environ. Samp.-4/14	0.1	±	0.5
-6	SG#21-920umhos-Environ. Samp.-4/15	0.0	±	0.3
-7	Cb4-850umhos-Environ. Samp.-4/13-Fixed	0.1	±	0.4
-8✓	A2-1300umhos-Environ. Samp.-4/14-Fixed	0.0	±	0.3
-9	Cb2-1600umhos-Environ. Samp.-4/14-Raw	0.0	±	0.3

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96_{σ}.

RECEIVED
JUN 9 1975
TOSCO/GOLDEN

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION
INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-107✓

FROM: F. C. Haas
TO: File

DATE: June 20, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Environmental Water Samples From Core Hole AT-1C, C-b Tract

Project 197

Three environmental water samples were taken from Core Hole AT-1C on April 17, 1975. Samples were taken from String Nos. 1, 2 and 3. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, trace metals and total organic carbon were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Golden, Colorado.

Industrial Laboratories had reported 800 mg/l of bicarbonate in the sample from String No. 3; a recheck analysis showed 465 mg/l as compared to TOSCO's 464 mg/l. However, their ionic balance on this sample is off by 17 percent, which is way too much. Their sodium value is probably too high.

Total organic carbon in all samples was less than 10 mg/l.

Gross alpha radiation in all samples was over 4 pCi/l; Ra_{226} was determined and all values were below 4 pCi/l.

FCH
FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

ENVIRONMENTAL WATER SAMPLES, CORE HOLE AT-1C
(Major Constituent Analyses)

Component	String No. 1		String No. 2		String No. 3	
	Industrial	TOSCO	Industrial	TOSCO	Industrial	TOSCO
Sodium, mg/l	310	320	330	313	345	227
Potassium, mg/l	18	7	11	3	16	4
Calcium, mg/l	10	4	6.6	7	46	44
Magnesium, mg/l	13	4	3.8	8	45	45
Lithium, mg/l	<1	<0.5	<1	<0.5	<1	<0.5
Sulfate, mg/l	58	17	17	14	330	303
Carbonate, mg/l	<0.1	30	36	18	<0.1	9
Bicarbonate, mg/l	770	780	695	738	465	464
Chloride, mg/l	2.9	4	4.3	3	10	6
Fluoride, mg/l	17	19	20	16	5.5	4
Borate, mg/l	1.7	3	2.5	2.3	0.6	1.1
Σ Cations, meq/l	15.52	14.62	15.27	14.69	21.41	15.88
Σ Anions, meq/l	14.85	15.32	14.18	13.97	15.08	14.62
% Difference	2.2	2.3	3.7	2.5	17.3	4.1
Silica, mg/l	12	10	26	19	24	13
pH	8.0	9.0	8.3	8.8	7.8	8.5
Conductivity µmhos/cm	1260	1150	1300	1150	1390	1250
Calculated TDS, mg/l	820	800	794	765	1050	883

THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202
Attn: John Matis

DATE RECEIVED:
DATE REPORTED: 6/17/75

LAB. NUMBER: See below

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Retests

ANALYSIS:

LAB #		RETEST	MILLIGRAMS PER LITER
9200	AT-1C #35	Bicarbonate	465
9201	A-1	Potassium	5.5
9207	A-3	Sodium	93
9210	A-9	Calcium	41
"		Sodium	110
9211	A-10	Calcium	39
"		Sodium	90
9212	SG-10 #15	Sulfate	760
"		Bicarbonate	12,400
"		Potassium	20
"		Lithium	12
"		Carbonate	5,360
9216	A-11	Calcium	56
9217	SG-11 S#1	Sulfate	800
"		Bicarbonate	14,400
"		Potassium	20
"		Carbonate	3,990
9219	SG-17 S#2	Sodium	1,200
"		Bicarbonate	1,270
"		Carbonate	340
9220	SG-17 S#1	Sulfate	705
"		Bicarbonate	9,850
"		Potassium	17
"		Lithium	6.5
"		Carbonate	2,850
9221	SG-18	Fluoride	4.0

MEMBERS OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY

H. Paul Ochs
CHEMIST

cc: Frank Haas

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9198

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: AT-1C-S1

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	10	0.499
Magnesium	13	1.069
Sodium	310	13.485
Carbonate	Less than 0.1	---
Bicarbonate	770	12.620
Chloride	2.9	0.081
Sulfate	58	1.207
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	12	0.399
Iron	Less than 0.05	---
Fluoride	17	0.894
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	630	
Hardness, in terms of calcium carbonate	80	
Total dissolved solids (calculated)	820	
Potassium	18	
Lithium	Less than 1.0	
Boron	0.43	
Hexavlant chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.0	

Specific conductance
1,260 micromhos per cc

pH 8.0

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

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SAMPLE MARKED: AT-1C S#2

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	6.6	0.329
Magnesium	3.8	0.312
Sodium	330	14.355
Carbonate	36	1.198
Bicarbonate	695	11.391
Chloride	4.3	0.121
Sulfate	17	0.353
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	26	0.865
Iron	Less than 0.05	---
Fluoride	20	1.052
P. alkalinity, in terms of calcium carbonate	30	
MO alkalinity, in terms of calcium carbonate	570	
Hardness, in terms of calcium carbonate	32	
Total dissolved solids (calculated)	795	
Potassium	11	
Lithium	Less than 1.0	
Boron	0.64	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.4	

Specific conductance
1,300 micromhos per cc

pH 8.3

MEMBER OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
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H. Paul Ochs
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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9200

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: AT-1C S#3

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	46	2.295
Magnesium	45	3.702
Sodium	345	15.007
Carbonate	Less than 0.1	---
Bicarbonate	800	13.112
Chloride	10	0.282
Sulfate	330	6.870
Nitrate	0.5	---
Phosphate	Less than 0.1	---
Silicon dioxide	24	0.799
Iron	Less than 0.05	---
Fluoride	5.5	0.289
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	655	
Hardness, in terms of calcium carbonate	300	
Total dissolved solids (calculated)	1,220	
Potassium	16	
Lithium	Less than 1.0	
Boron	0.16	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.1	

Specific conductance
1,390 micromhos per cc

pH 7.8

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
CHEMIST

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: AT-1C String #1 Environmental Sample
4-17-75

IAD No.: 97-302-002-26

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.002	Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.03	Titanium	0.08
Bismuth	0.002	Europium		Niobium	≤0.001	Scandium	≤0.001
Lead	0.01	Samarium		Zirconium	≤0.001	Calcium	**
Thallium		Neodymium		Yttrium	≤0.001	Potassium	**
Mercury	*0.00012	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.04	Sulfur	**
Platinum		Lanthanum		Bromine	0.01	Phosphorus	0.04
Iridium		Barium	0.3	Selenium	0.002	Silicon	**
Osmium		Cesium	0.04	Arsenic	0.003	Aluminum	0.08
Rhenium		Iodine		Germanium	0.002	Magnesium	**
Tungsten	0.02	Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony	0.006	Zinc	0.7	Fluorine	**
Hafnium		Tin		Copper	0.03	Oxygen	NR
Lutetium		Indium	STD	Nickel	≤0.001	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	0.004	Carbon	NR
Thulium		Silver		Iron	0.2	Boron	0.07
Erbium		Palladium		Manganese	0.04	Beryllium	
Holmium		Rhodium		Chromium	0.002	Lithium	0.09
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.001 μg/ml
*Flameless Atomic Absorption
** Not reported upon request

Approved: M G Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: AT-1C String #2 Environmental Sample
4-17-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.001
Thorium		Gadolinium		Molybdenum	0.08	Titanium	0.03
Bismuth	≤0.001	Europium		Niobium		Scandium	0.002
Lead	0.02	Samarium		Zirconium	0.01	Calcium	**
Thallium		Neodymium		Yttrium	≤0.001	Potassium	**
Mercury	*0.00004	Praseodymium		Strontium	1	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum	≤0.001	Bromine	0.008	Phosphorus	0.2
Iridium		Barium	0.2	Selenium	0.003	Silicon	**
Osmium		Cesium	0.03	Arsenic	0.01	Aluminum	0.4
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten	0.05	Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony	0.002	Zinc	0.05	Fluorine	**
Hafnium		Tin	0.002	Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	≤0.001	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	0.001	Carbon	NR
Thulium		Silver		Iron	0.2	Boron	0.03
Erbium		Palladium		Manganese	0.3	Beryllium	
Holmium		Rhodium		Chromium	0.002	Lithium	0.06
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported <0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
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To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: AT-1C String #3 Environmental Sample
4-17-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	≤0.001	Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.03	Titanium	0.05
Bismuth		Europium		Niobium		Scandium	≤0.003
Lead	0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00022	Praseodymium		Strontium	3	Chlorine	**
Gold		Cerium		Rubidium	0.04	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.09
Iridium		Barium	0.06	Selenium	≤0.004	Silicon	**
Osmium		Cesium	0.004	Arsenic	0.02	Aluminum	0.08
Rhenium		Iodine	≤0.001	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony	0.003	Zinc	0.07	Fluorine	**
Hafnium		Tin	0.003	Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	≤0.001	Nitrogen	NR
Ytterbium		Cadmium		Cobalt		Carbon	NR
Thulium		Silver		Iron	0.08	Boron	≤0.001
Erbium		Palladium		Manganese	0.04	Beryllium	≤0.001
Holmium		Rhodium		Chromium	≤0.001	Lithium	0.02
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.001 µg/ml
*Flameless Atomic Absorption
**Not reported upon request

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5°C, 920 μmhos, Environmental Sample 4-15-75	2		
2) SG #20 13°C, 2800 μmhos, Environmental Sample 4-14-75	8		
3) SG #19 11°C, 2825 μmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 μmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 μmhos Environmental Sample 4-11-75	8		
6) Cb-4 14°C 850 μmhos Environmental Sample 4-13-75	3		
7) Cb-2 13°C 1600 μmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14°C 3800 μmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5°C 1300 μmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
✓1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
✓2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
✓3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES

HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	pCi/1 α Total	±	α Precision*	β Total	±	β Precision*
8166-1+	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+ ✓	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+ ✓	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+ ✓	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

Date: June 16, 1975
HRI Project No. 535
HRI Series No. 8166
Samples received: 5/6/75

REPORT OF ANALYSIS

Analysis No.	Sample Designation	pCi/l		
		Ra^{226}	±	Precision*
8166-1	SG#1, String #1, Reg. Envir. Samp. RAW, 4225 umhos, 4/29	0.0	±	0.4
-2	SG#1, String #2, Reg. Envir. Samp. RAW, 1800 umhos, 4/30	0.0	±	0.3
-4	SG#6, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 4/18	0.4	±	0.6
-7	SG#8, String #2, Reg. Envir. Samp. RAW, 2100 umhos, 4/24	0.0	±	0.4
-8	SG#10, String #1, Envir. Sample Metals + Acid Fixed, 50000 umhos, 5/1	16	±	4
-9	SG#10A, Envir. Sample Reg. RAW, 1400 umhos, 5/3	0.0	±	0.4
-10	SG#11, String #1, Reg. Envir. Samp. RAW, 45000 umhos	4.3	±	1.9
-11	SG#11, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 5/2	0.0	±	0.4
-12	SG#11, String #3, Reg. Envir. Samp. RAW, 1800 umhos, 5/2	0.0	±	0.4
-14	SG#17, String #2, Reg. Envir. Samp. RAW, 47000 umhos, 4/28	0.2	±	0.4
-16 ✓	AT-1C, String #1, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.7	±	0.6
-17 ✓	AT-1C, String #2, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.1	±	0.4
-18 ✓	AT-1C, String #3, Reg. Envir. Samp. RAW, 1300 umhos, 4/17	0.0	±	0.5
-19	A-5, Reg. Envir. Samp. RAW, 1425 umhos, 4/25	0.0	±	0.4
-21	A-8, Reg. Envir. Samp. RAW, 1300 umhos, 4/26	0.0	±	0.4
-22	A-9, Reg. Envir. Samp. RAW, 1175 umhos, 4/26	0.0	±	0.4
-23	A-10, Reg. Envir. Samp. RAW, 1500 umhos, 4/26	0.0	±	0.4
-24	A-11, Reg. Envir. Samp. RAW, 1450 umhos, 4/25	0.0	±	0.4
-25	A-12, Reg. Envir. Samp. RAW, 1600 umhos, 4/26	0.0	±	0.4

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

RECEIVED
JUN 19 1975
TOSCO/GOLDE

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* ± Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96δ.

J. R. Matis

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-102

FROM: F. C. Haas

TO: File

DATE: June 17, 1975

FILE NO.: 5100-3

SUBJECT: Analyses of Environmental Water Samples from Core Hole Nos. C-b-1, C-b-2 and C-b-4 - Project 197

Three environmental water samples were taken from Core Hole Nos. C-b-1, C-b-2 and C-b-4. Samples were taken on 4-12-75 (C-b-1), 4-14-75 (C-b-2) and 4-13-75 (C-b-4). These samples were analyzed for major and minor constituents, trace metals, radioactivity and total organic carbon. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Trace metals and minor constituents were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado. Results of the analyses are attached.

There are no major discrepancies in the major constituent analyses.

Total organic carbon in all samples was less than 10 milligrams per liter.

Gross alpha radiation in all samples was greater than 4 pCi per liter; Ra_{226} was determined and found to be less than 4 pCi per liter.

FCH/dt
Encs

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski
J. R. Matis
P. Boileau

ENVIRONMENTAL SAMPLES FROM CORE HOLES C-b-1, C-b-2 AND C-b-4

(Major Constituent Analyses)

Component	C-b-1		C-b-2		C-b-4	
	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO
Sodium, mg/l	990	1067	420	350	180	146
Potassium, mg/l	2.5	14	8.5	6	<1	0.7
Calcium, mg/l	9	5	4.1	3	48	23
Magnesium, mg/l	7.2	4	3.3	3	12	25
Lithium, mg/l	<1	<0.5	<1	<0.5	<1	<0.5
Sulfate, mg/l	32	12	370	305	145	126
Carbonate, mg/l	79	43	73	46	12	8
Bicarbonate, mg/l	2360	2706	440	550	400	396
Chloride, mg/l	27	30	14	11	11	7
Fluoride, mg/l	28	26	1.8	4.0	0.9	0.7
Borate, mg/l	3.5	3.6	<0.1	0.7	1.6	1.5
$\sum$Cations, meq/l	44.15	47.28	18.96	15.77	11.21	9.57
$\sum$Anions, meq/l	43.80	48.34	17.84	17.30	10.24	9.69
% Difference	0.4	1.1	3.0	4.8	5.0	0.6
Silica, mg/l						
pH	8.2	8.7	8.7	8.7	8.2	8.7
Conductivity, µmhos/cm	3900	4000	1750	1600	920	850
Calculated TDS, mg/l	2350	2544	1129	1013	639	554

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9106

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Cb-1 4/12/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	9	0.449
Magnesium	7.2	0.592
Sodium	990	43.065
Carbonate	79	2.630
Bicarbonate	2,360	38.680
Chloride	27	0.761
Sulfate	32	0.666
Nitrate	0.9	---
Phosphate	Less than 0.1	---
Silicon dioxide	15	0.499
Iron	Less than 0.05	---
Fluoride	28	1.472
P. alkalinity, in terms of calcium carbonate	65	
MO alkalinity, in terms of calcium carbonate	1,940	
Hardness, in terms of calcium carbonate	52	
Total dissolved solids (calculated)	2,350	
Potassium	2.5	
Lithium	Less than 1.0	
Boron	0.9	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	3.4	

pH 8.2

Specific conductance
3,900 micromhos per cc

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

MEMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9107

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Cb-2 4/14/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	4.1	0.204
Magnesium	3.3	0.271
Sodium	420	18.270
Carbonate	73	2.430
Bicarbonate	440	7.211
Chloride	14	0.394
Sulfate	370	7.703
Nitrate	1.2	---
Phosphate	Less than 0.1	---
Silicon dioxide	19	0.632
Iron	1.2	---
Fluoride	1.8	
P. alkalinity, in terms of calcium carbonate	60	
MO alkalinity, in terms of calcium carbonate	360	
Hardness, in terms of calcium carbonate	24	
Total dissolved solids (calculated)	1,120	
Potassium	8.5	
Lithium	Less than 1.0	
Boron	Less than 0.1	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.5	

pH 8.7

Specific conductance
1,750 micromhos per cc

THE INDUSTRIAL LABORATORIES COMPANY
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II B-103

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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9108

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: Cb-4 4/13/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	48	2.395
Magnesium	12	0.987
Sodium	180	7.830
Carbonate	12	0.399
Bicarbonate	400	6.556
Chloride	11	0.310
Sulfate	145	3.018
Nitrate	0.4	---
Phosphate	0.1	---
Silicon dioxide	32	1.065
Iron	Less than 0.05	
Fluoride	0.9	
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	325	
Hardness, in terms of calcium carbonate	170	
Total dissolved solids (calculated)	640	
Potassium	Less than 1.0	
Lithium	Less than 1.0	
Boron	0.4	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.4	

pH 8.2

Specific conductance
920 micromhos per cc

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AMERICAN CHEMICAL SOCIETY
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THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

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TOSCO/GOLDEN

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: Cb-1 14°C 3800 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.004
Thorium		Gadolinium		Molybdenum	***0.07	Titanium	0.2
Bismuth		Europium		Niobium		Scandium	≤0.003
Lead	0.02	Samarium		Zirconium	0.004	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00009	Praseodymium		Strontium	0.6	Chlorine	**
Gold		Cerium		Rubidium	0.04	Sulfur	**
Platinum		Lanthanum		Bromine	0.01	Phosphorus	0.1
Iridium		Barium	0.3	Selenium	0.004	Silicon	**
Osmium		Cesium	0.009	Arsenic	0.008	Aluminum	0.08
Rhenium		Iodine	0.004	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	0.003	Sodium	**
Tantalum		Antimony		Zinc	0.09	Fluorine	**
Hafnium		Tin		Copper	0.03	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.06	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	0.01	Carbon	NR
Thulium		Silver		Iron	0.2	Boron	0.09
Erbium		Palladium		Manganese	0.002	Beryllium	
Holmium		Rhodium		Chromium	0.01	Lithium	0.02
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.003 μg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M Jacobs
*** Heterogeneous

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JUN 5 1975
TOSCO/GOLDEN

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-0434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: Cb-2 13°C 1600 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.03	Terbium		Ruthenium		Vanadium	0.003
Thorium		Gadolinium		Molybdenum	0.04	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.07	Samarium		Zirconium	0.002	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00041	Praseodymium	≤0.001	Strontium	0.8	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum	0.003	Bromine	0.03	Phosphorus	***1
Iridium		Barium	0.1	Selenium	0.002	Silicon	**
Osmium		Cesium	0.007	Arsenic	0.02	Aluminum	MC
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten	0.01	Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony	0.01	Zinc	0.1	Fluorine	**
Hafnium		Tin		Copper	0.05	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.2	Nitrogen	NR
Ytterbium		Cadmium	0.004	Cobalt	0.008	Carbon	NR
Thulium		Silver	≤0.001	Iron	2	Boron	0.03
Erbium		Palladium		Manganese	0.1	Beryllium	
Holmium		Rhodium		Chromium	0.01	Lithium	0.2
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.0009μg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M Jacobs
***Heterogeneous

RECEIVED
JUN 5 1975
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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

SINCE 1908

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: Cb-4 14°C 850 µmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.02	Terbium		Ruthenium		Vanadium	0.001
Thorium		Gadolinium		Molybdenum	0.04	Titanium	0.3
Bismuth		Europium		Niobium		Scandium	≤0.004
Lead	0.02	Samarium		Zirconium		Calcium	**
Thallium	*0.00017	Neodymium		Yttrium		Potassium	**
Mercury		Praseodymium		Strontium	3	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum	0.006	Bromine	0.06	Phosphorus	0.1
Iridium		Barium	0.2	Selenium		Silicon	**
Osmium		Cesium	0.01	Arsenic	0.02	Aluminum	0.3
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten	0.02	Tellurium		Gallium	≤0.002	Sodium	**
Tantalum		Antimony	0.008	Zinc	1	Fluorine	**
Hafnium		Tin		Copper	0.09	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.08	Nitrogen	NR
Ytterbium		Cadmium	0.008	Cobalt	0.006	Carbon	NR
Thulium		Silver		Iron	1	Boron	0.02
Erbium		Palladium		Manganese	0.02	Beryllium	
Holmium		Rhodium		Chromium	0.01	Lithium	0.1
Dysprosium						Hydrogen	NR

II B-107

NR — Not Reported
All elements not reported ≤0.002 µg/ml
* Flameless Atomic Absorption

Approved: M. Jacobs
** Not reported upon request

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5°C, 920 μmhos, Environmental Sample 4-15-75	2		
2) SG #20 13°C, 2800 μmhos, Environmental Sample 4-14-75	8		
3) SG #19 11°C, 2825 μmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 μmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 μmhos Environmental Sample 4-11-75	8		
✓6) Cb-4 14°C 850 μmhos Environmental Sample 4-13-75	3		
✓7) Cb-2 13°C 1600 μmhos, Environmental Sample 4-14-75	4		
✓8) Cb-1 14°C 3800 μmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5°C 1300 μmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

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HAZEN RESEARCH, INC.
4601 Ind[illegible]a Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 16, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Analysis No.	Sample Designation	pCi/l α Total ± Precision*	 β Total ± Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	7.6 ± 3.8	0 ± 14
-2	SG#9-String 1-6500nmhos-Environ. Samp.-4/11	6.4 ± 4.3	0 ± 25
-3 ✓	Cb1-3800nmhos-Environ. Samp.-4/12-Fixed	18 ± 6	0 ± 23
-4	SG#19-2825nmhos-Environ. Samp.-4/13	20 ± 7	0 ± 22
-5	SG#20-2800nmhos-Environ. Samp.-4/14	12 ± 6	0 ± 21
-6	SG#21-920nmhos-Environ. Samp.-4/15	9.2 ± 3.2	0 ± 13
-7 ✓	Cb4-850nmhos-Envifon. Samp.-4/13-Fixed	16 ± 4	0 ± 13
-8	A2-1300nmhos-Environ. Samp.-4/14-Fixed	6.3 ± 3.1	0 ± 13
-9 ✓	Cb2-1600nmhos-Environ. Samp.-4/14-Raw	12 ± 4	0 ± 13

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96_{σ}.

Note: All samples will be analyzed for Ra^{226}.

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MAY 19 1975
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HAZEN RESEARCH, INC.
4601 In[illegible]ana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

June 6, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Addition to Report dated 5/16/75

Analysis No.	Sample Designation	pCi/l Ra^{226}	 ±	 Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	0.0	±	0.3
-2	SG#9-String 1-6500umhos-Environ. Samp.-4/11	0.0	±	0.4
-3 ✓	Cb1-3800umhos-Environ. Samp.-4/12-Fixed	0.1	±	0.4
-4	SG#19-2825umhos-Environ. Samp.-4/13	0.3	±	0.5
-5	SG#20-2800umhos-Environ. Samp.-4/14	0.1	±	0.5
-6	SG#21-920umhos-Environ. Samp.-4/15	0.0	±	0.3
-7 ✓	Cb4-850umhos-Environ. Samp.-4/13-Fixed	0.1	±	0.4
-8	A2-1300umhos-Environ. Samp.-4/14-Fixed	0.0	±	0.3
-9 ✓	Cb2-1600umhos-Environ. Samp.-4/14-Raw	0.0	±	0.3

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

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*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96$_{\sigma}$.

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JUN 9 1975

THE OIL SHALE CORPORATION
INTER OFFICE MEMORANDUM

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

LABORATORY DATA LETTER 75-108

FROM: F. C. Haas
TO: File

DATE: June 20, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Environmental Water Samples From Core Hole SG-1, C-b Tract

Project 197

Two environmental water samples were taken from Core Hole SG-1. Samples were taken from No. 1 String on April 29, 1975, and from No. 2 String on April 30, 1975. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, trace metals and total organic carbon were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado.

There are no major discrepancies in the major constituent analysis.

Total organic carbon in both samples was less than 10 mg/l.

Gross alpha radiation in both samples was greater than 4 pCi/l; Ra_{226} was determined and found to be less than 4 pCi/l.

FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

ENVIRONMENTAL WATER SAMPLES, CORE HOLE SG-1
(Major Constituent Analyses)

	String No. 1		String No. 2	
Component	Industrial	TOSCO	Industrial	TOSCO
Sodium, mg/l	1250	1200	245	227
Potassium, mg/l	29	12	2.1	1.2
Calcium, mg/l	16	12	43	29
Magnesium, mg/l	15	15	39	43
Lithium, mg/l	1	1.3	<1	<0.5
Sulfate, mg/l	125	148	215	239
Carbonate, mg/l	36	62	12	24
Bicarbonate, mg/l	2650	2550	605	578
Chloride, mg/l	270	282	20	18
Fluoride, mg/l	21	21	3	2.5
Borate, mg/l	47	16	1.6	1.9
Σ Cations, meq/l	57.27	54.50	16.07	14.89
Σ Anions, meq/l	57.08	56.38	15.56	15.93
% Difference	0.2	1.7	1.5	3.4
Silica, mg/l	18	13	30	21
pH	8.2	8.7	8.1	8.7
Conductivity, µmhos/cm	4600	4400	1320	1200
Calculated TDS, mg/l	3127	3032	919	890

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202

Attn: John Matis

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9196

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG #1 - String #1

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	16	0.798
Magnesium	15	1.234
Sodium	1,250	54.375
Carbonate	36	1.198
Bicarbonate	2,650	43.433
Chloride	270	7.616
Sulfate	125	2.602
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	18	0.599
Iron	Less than 0.05	---
Fluoride	21	1.630
P. alkalinity, in terms of calcium carbonate	30	
MO alkalinity, in terms of calcium carbonate	2,170	
Hardness, in terms of calcium carbonate	100	
Total dissolved solids (calculated)	3,080	
Ammonia-nitrogen	4.4	
Potassium	29	
Lithium	1.0	
Boron	12	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	

Specific conductance
4.600 micromhos per cc

pH 8.2

THE INDUSTRIAL LABORATORIES COMPANY

J. Paul Ucko

CHEMIST

MEMBER OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
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INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

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THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9197

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG #1 String #2

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	43	2.145
Magnesium	39	3.208
Sodium	245	10.657
Carbonate	12	0.399
Bicarbonate	605	9.915
Chloride	20	0.564
Sulfate	215	4.476
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	30	0.999
Iron	Less than 0.05	---
Fluoride	3.0	0.157
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	495	
Hardness, in terms of calcium carbonate	270	
Total dissolved solids (calculated)	905	
Potassium	2.1	
Lithium	Less than 1.0	
Boron	0.42	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.5	

Specific conductance
1,320 micromhos per cc

pH 8.1

[illegible]S OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
CHEMIST

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #1 String #1 Environmental Sample
4-29-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.02	Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.1	Titanium	0.006
Bismuth	≤0.001	Europium		Niobium	≤0.001	Scandium	0.002
Lead	0.02	Samarium		Zirconium	0.08	Calcium	**
Thallium	≤0.001	Neodymium		Yttrium		Potassium	**
Mercury	*0.00029	Praseodymium	≤ 0.001	Strontium	0.9	Chlorine	**
Gold		Cerium	≤0.001	Rubidium	0.1	Sulfur	**
Platinum		Lanthanum	0.006	Bromine	0.2	Phosphorus	0.03
Iridium		Barium	0.09	Selenium	***	Silicon	**
Osmium		Cesium	0.1	Arsenic	0.005	Aluminum	MC
Rhenium		Iodine	0.06	Germanium		Magnesium	**
Tungsten	0.01	Tellurium	0.002	Gallium	0.002	Sodium	**
Tantalum		Antimony	0.007	Zinc	0.1	Fluorine	**
Hafnium		Tin	≤0.001	Copper	0.09	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.001	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.3
Erbium		Palladium		Manganese	0.1	Beryllium	≤0.001
Holmium		Rhodium		Chromium	0.006	Lithium	MC
Dysprosium						Hydrogen	NR

II B-115

NR — Not Reported
All elements not reported <0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

*** Interference

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #1 String #2 Environmental Sample
4-30-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.003
Thorium		Gadolinium		Molybdenum	0.02	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	0.006
Lead	0.02	Samarium		Zirconium	≤0.002	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00036	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.07
Iridium		Barium	0.04	Selenium	0.004	Silicon	**
Osmium		Cesium	0.003	Arsenic	0.03	Aluminum	0.9
Rhenium		Iodine	0.006	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.1	Fluorine	**
Hafnium		Tin		Copper	0.05	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	0.6	Boron	≤0.002
Erbium		Palladium		Manganese	0.03	Beryllium	≤0.002
Holmium		Rhodium		Chromium	0.01	Lithium	0.02
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported <0.002 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-952

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5^{0}C, 920 µmhos, Environmental Sample 4-15-75	2		
2) SG #20 13^{0}C, 2800 µmhos, Environmental Sample 4-14-75	8		
3) SG #19 11^{0}C, 2825 µmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17^{0}C, 1800 µmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21^{0}C 65 µmhos Environmental Sample 4-11-75	8		
6) Cb-4 14^{0}C 850 µmhos Environmental Sample 4-13-75	3		
7) Cb-2 13^{0}C 1600 µmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14^{0}C 3800 µmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5^{0}C 1300 µmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
✓4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
✓5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

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HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	α Total (pCi/l)	±	α Precision* (pCi/l)	β Total (pCi/l)	±	β Precision* (pCi/l)
8166-1+ ✓	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+ ✓	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

Date: June 16, 1975
HRI Project No. 535
HRI Series No. 8166
Samples received: 5/6/75

REPORT OF ANALYSIS

Analysis No.	Sample Designation	pCi/l		
		Ra^{226}	±	Precision*
8166-1 ✓	SG#1, String #1, Reg. Envir. Samp. RAW, 4225 umhos, 4/29	0.0	±	0.4
-2 ✓	SG#1, String #2, Reg. Envir. Samp. RAW, 1800 umhos, 4/30	0.0	±	0.3
-4	SG#6, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 4/18	0.4	±	0.6
-7	SG#8, String #2, Reg. Envir. Samp. RAW, 2100 umhos, 4/24	0.0	±	0.4
-8	SG#10, String #1, Envir. Sample Metals + Acid Fixed, 50000 umhos, 5/1	16	±	4
-9	SG#10A, Envir. Sample Reg. RAW, 1400 umhos, 5/3	0.0	±	0.4
-10	SG#11, String #1, Reg. Envir. Samp. RAW, 45000 umhos	4.3	±	1.9
-11	SG#11, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 5/2	0.0	±	0.4
-12	SG#11, String #3, Reg. Envir. Samp. RAW, 1800 umhos, 5/2	0.0	±	0.4
-14	SG#17, String #2, Reg. Envir. Samp. RAW, 47000 umhos, 4/28	0.2	±	0.4
-16	AT-1C, String #1, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.7	±	0.6
-17	AT-1C, String #2, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.1	±	0.4
-18	AT-1C, String #3, Reg. Envir. Samp. RAW, 1300 umhos, 4/17	0.0	±	0.5
-19	A-5, Reg. Envir. Samp. RAW, 1425 umhos, 4/25	0.0	±	0.4
-21	A-8, Reg. Envir. Samp. RAW, 1300 umhos, 4/26	0.0	±	0.4
-22	A-9, Reg. Envir. Samp. RAW, 1175 umhos, 4/26	0.0	±	0.4
-23	A-10, Reg. Envir. Samp. RAW, 1500 umhos, 4/26	0.0	±	0.4
-24	A-11, Reg. Envir. Samp. RAW, 1450 umhos, 4/25	0.0	±	0.4
-25	A-12, Reg. Envir. Samp. RAW, 1600 umhos, 4/26	0.0	±	0.4

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

RECEIVED
JUN 19 197
TOSCO/GOLD

* ± Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96δ.

J. R. Matis

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-111

FROM: F. C. Haas
TO: File

DATE: June 20, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Environmental Water Samples from Core Hole SG-6, C-b Tract

Project 197

Three environmental water samples were taken from Core Hole SG-6 on April 18, 1975. Samples were taken from String Nos. 1, 2 and 3. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, trace metals and total organic carbon were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado.

There are no major discrepancies in the major constituent analyses.

Total organic carbon in all samples was less than 10 mg/liter.

Gross alpha radiation in String No. 2 was above 4 pCi/liter; Ra_{226} was determined and found to be less than 4 pCi/liter.

FCH/ec
Encs.

Approved (MTA)

cc: R. G. Vawter
H. M Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

ENVIRONMENTAL WATER SAMPLES FROM CORE HOLE SG-6

(Major Constituent Analyses)

	String No. 1		String No. 2		String No. 3	
Component	Ind.	TOSCO	Ind.	TOSCO	Ind.	TOSCO
Sodium, mg/l	460	453	245	287	200	180
Potassium, mg/l	40	32	20	11	1	1
Calcium, mg/l	19	16	12	8	93	74
Magnesium, mg/l	9.8	9	17	16	80	99
Lithium, mg/l	<1	<0.5	<1	<0.5	<1	<0.5
Sulfate, mg/l	170	181	93	107	510	519
Carbonate, mg/l	6	12	30	18	12	6
Bicarbonate, mg/l	755	817	525	598	455	439
Chloride, mg/l	220	175	64	73	34	49
Fluoride, mg/l	11	10	12	11	0.4	0.3
Borate, mg/l	2.5	2.5	2.7	2.2	1.3	1.0
Σ Cations, meq/l	22.78	22.05	13.16	14.48	19.93	19.70
Σ Anions, meq/l	22.95	23.07	14.04	15.32	19.49	19.63
% Difference	0.4	2.2	3.6	2.8	1.1	0.2
Silica, mg/l	5.3	5	3.3	2.1	23	15
pH	8.2	8.4	8.5	8.8	8	8.3
Conductivity, μmhos/cm	2090	2100	1305	1250	1580	1475
Calculated TDS, mg/l	1314	1296	756	828	1177	1159

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9205

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG 6 S#1

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	19	0.948
Magnesium	9.8	0.806
Sodium	460	20.010
Carbonate	6	0.199
Bicarbonate	755	12.374
Chloride	220	6.206
Sulfate	170	3.539
Nitrate	1.6	0.025
Phosphate	Less than 0.1	---
Silicon dioxide	5.3	0.176
Iron	Less than 0.05	---
Fluoride	11	0.578
P. alkalinity, in terms of calcium carbonate	4.9	
MO alkalinity, in terms of calcium carbonate	620	
Hardness, in terms of calcium carbonate	88	
Total dissolved solids (calculated)	1,310	
Potassium	40	
Lithium	Less than 1.0	
Boron	0.65	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	6.3	

Specific conductance
2,090 micromhos per cc

pH 8.2

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9203

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

AMPLE MARKED: SG-6 S#2

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	12	0.598
Magnesium	17	1.398
Sodium	245	10.652
Carbonate	30	0.999
Bicarbonate	525	8.604
Chloride	64	1.805
Sulfate	93	1.936
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	3.3	0.109
Iron	Less than 0.05	---
Fluoride	12	0.631
P. alkalinity, in terms of calcium carbonate	25	
MO alkalinity, in terms of calcium carbonate	430	
Hardness, in terms of calcium carbonate	100	
Total dissolved solids (calculated)	755	
Potassium	20	
Lithium	Less than 1.0	
Boron	0.70	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.8	

Specific conductance
1,305 micromhos per cc

pH 8.5

THE INDUSTRIAL LABORATORIES COMPANY
CHEMIST

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
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THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9204

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-6 S#3

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	93	4.640
Magnesium	80	6.582
Sodium	200	8.700
Carbonate	12	0.399
Bicarbonate	455	7.457
Chloride	34	0.959
Sulfate	510	10.618
Nitrate	0.5	---
Phosphate	Less than 0.1	---
Silicon dioxide	23	0.766
Iron	0.44	---
Fluoride	0.3	---
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	370	
Hardness, in terms of calcium carbonate	560	
Total dissolved solids (calculated)	1,170	
Potassium	Less than 1.0	
Lithium	Less than 1.0	
Boron	0.35	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.8	

Specific conductance
1,580 micromhos per cc

pH 8.3

MEMBER OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #~~7~~6 String #1 Environmental Sample
4-18-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.002
Thorium		Gadolinium		Molybdenum	0.01	Titanium	0.05
Bismuth		Europium		Niobium	≤0.001	Scandium	0.006
Lead	0.01	Samarium		Zirconium	0.002	Calcium	**
Thallium		Neodymium		Yttrium	0.01	Potassium	**
Mercury	*0.0027	Praseodymium		Strontium	0.7	Chlorine	**
Gold		Cerium		Rubidium	0.09	Sulfur	**
Platinum		Lanthanum	0.002	Bromine	0.05	Phosphorus	0.09
Iridium		Barium	0.06	Selenium		Silicon	**
Osmium		Cesium	0.01	Arsenic	0.003	Aluminum	0.5
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	0.001	Sodium	**
Tantalum		Antimony		Zinc	0.03	Fluorine	**
Hafnium		Tin		Copper	0.03	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.001	Carbon	NR
Thulium		Silver		Iron	0.8	Boron	0.02
Erbium		Palladium		Manganese	0.2	Beryllium	
Holmium		Rhodium		Chromium	0.005	Lithium	0.09
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M J Jacobs

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #6 String #2 Enivronmental Sample
4-18-75

IAD No.: 97-302-002-26

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.02	Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.1	Titanium	0.05
Bismuth		Europium		Niobium	≤0.001	Scandium	0.003
Lead	0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.0016	Praseodymium		Strontium	0.7	Chlorine	**
Gold		Cerium		Rubidium	0.04	Sulfur	**
Platinum		Lanthanum	0.01	Bromine	0.05	Phosphorus	0.04
Iridium		Barium	0.06	Selenium		Silicon	**
Osmium		Cesium	0.02	Arsenic	0.009	Aluminum	***2
Rhenium		Iodine	0.02	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony	0.002	Zinc	MC	Fluorine	*
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.006	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.001	Carbon	NR
Thulium		Silver		Iron	0.2	Boron	0.02
Erbium		Palladium		Manganese	0.02	Beryllium	
Holmium		Rhodium		Chromium	0.008	Lithium	0.9
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported <0.001 μg/ml
* Flameless Atomic Absorption
** Not reported upon request

*** Heterogeneous

Approved: M L Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #6 String #3 Environmental Sample
4-18-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.002
Thorium		Gadolinium		Molybdenum	0.003	Titanium	0.05
Bismuth		Europium		Niobium		Scandium	≤0.003
Lead	0.007	Samarium		Zirconium	≤0.001	Calcium	**
Thallium		Neodymium		Yttrium	≤0.001	Potassium	**
Mercury	*0.0029	Praseodymium		Strontium	17	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum		Bromine	0.01	Phosphorus	0.02
Iridium		Barium	0.06	Selenium	≤0.004	Silicon	**
Osmium		Cesium	0.004	Arsenic	0.009	Aluminum	0.5
Rhenium		Iodine	0.004	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.7	Fluorine	**
Hafnium		Tin		Copper	0.03	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.001	Carbon	NR
Thulium		Silver		Iron	0.8	Boron	0.02
Erbium		Palladium		Manganese	0.2	Beryllium	
Holmium		Rhodium		Chromium	0.06	Lithium	0.09
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

Approved: M Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5°C, 920 µmhos, Environmental Sample 4-15-75	2		
2) SG #20 13°C, 2800 µmhos, Environmental Sample 4-14-75	8		
3) SG #19 11°C, 2825 µmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 µmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 µmhos Environmental Sample 4-11-75	8		
6) Cb-4 14°C 850 µmhos Environmental Sample 4-13-75	3		
7) Cb-2 13°C 1600 µmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14°C 3800 µmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5°C 1300 µmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #6 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

HAZEN RE[illegible]RCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	pCi/l					
		α Total	±	α Precision*	β Total	±	β Precision*
8166-1+	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3✓	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+✓	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5 ✓	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

HAZ RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

Date: June 16, 1975
HRI Project No. 535
HRI Series No. 8166
Samples received: 5/6/75

REPORT OF ANALYSIS

Analysis No.	Sample Designation	pCi/l Ra^{226}	±	Precision*
8166-1	SG#1, String #1, Reg. Envir. Samp. RAW, 4225 umhos, 4/29	0.0	±	0.4
-2	SG#1, String #2, Reg. Envir. Samp. RAW, 1800 umhos, 4/30	0.0	±	0.3
-4 ✓	SG#6, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 4/18	0.4	±	0.6
-7	SG#8, String #2, Reg. Envir. Samp. RAW, 2100 umhos, 4/24	0.0	±	0.4
-8	SG#10, String #1, Envir. Sample Metals + Acid Fixed, 50000 umhos, 5/1	16	±	4
-9	SG#10A, Envir. Sample Reg. RAW, 1400 umhos, 5/3	0.0	±	0.4
-10	SG#11, String #1, Reg. Envir. Samp. RAW, 45000 umhos	4.3	±	1.9
-11	SG#11, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 5/2	0.0	±	0.4
-12	SG#11, String #3, Reg. Envir. Samp. RAW, 1800 umhos, 5/2	0.0	±	0.4
-14	SG#17, String #2, Reg. Envir. Samp. RAW, 47000 umhos, 4/28	0.2	±	0.4
-16	AT-1C, String #1, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.7	±	0.6
-17	AT-1C, String #2, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.1	±	0.4
-18	AT-1C, String #3, Reg. Envir. Samp. RAW, 1300 umhos, 4/17	0.0	±	0.5
-19	A-5, Reg. Envir. Samp. RAW, 1425 umhos, 4/25	0.0	±	0.4
-21	A-8, Reg. Envir. Samp. RAW, 1300 umhos, 4/26	0.0	±	0.4
-22	A-9, Reg. Envir. Samp. RAW, 1175 umhos, 4/26	0.0	±	0.4
-23	A-10, Reg. Envir. Samp. RAW, 1500 umhos, 4/26	0.0	±	0.4
-24	A-11, Reg. Envir. Samp. RAW, 1450 umhos, 4/25	0.0	±	0.4
-25	A-12, Reg. Envir. Samp. RAW, 1600 umhos, 4/26	0.0	±	0.4

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

RECEIVE
JUN 19 19
TOSCO/GOL

* ± Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.966.

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-109

FROM: F. C. Haas
TO: File

DATE: June 23, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Environmental Water Samples From Core Hole SG-8, C-b Tract

Project 197

Two environmental water samples and one organic "crud" were taken from Core Hole SG-8 on April 23 and 24, 1975. Major constituent analyses on the water samples was done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flat. Minor constituents, trace metals and total organic carbon on the water samples were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity on the water samples was done by Hazen Research, Golden, Colorado.

There are no major discrepancies in the major constituent analyses.

Total organic carbon in both samples was less than 10 mg/liter.

Gross alpha radiation in String No. 2 was greater than 4 pCi/liter; Ra_{226} was determined and found to be less than 4 pCi/liter.

The organic "crud" was a brown waxy paste with high water and solids content. Overall, the material gave the appearance of a topped, waxy crude.

The attached Laboratory Data Letter from C. M. Smits to F. C. Haas gives a detailed description of the material.

FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

ENVIRONMENTAL WATER SAMPLES FROM CORE HOLE SG-8
(Major Constituent Analyses)

	String No. 1		String No. 2	
Component	Industrial	TOSCO	Industrial	TOSCO
Sodium, mg/l	490	493	490	513
Potassium, mg/l	1	1	1	2
Calcium, mg/l	5.3	3	24	20
Magnesium, mg/l	8.5	3	29	27
Lithium, mg/l	<1	<0.5	<1	<0.5
Sulfate, mg/l	12	24	105	124
Carbonate, mg/l	33	30	36	42
Bicarbonate, mg/l	1200	1232	1210	1281
Chloride, mg/l	2.8	3	35	38
Fluoride, mg/l	26	22	15	14
Borate, mg/l	4.3	3.9	7.4	7.8
Σ Cations, meq/l	22.29	21.86	24.52	25.58
Σ Anions, meq/l	22.57	23.03	25.18	26.97
% Difference	0.6	2.6	1.3	1.9
Silica, mg/l	14	13	18	16
pH	8.4	8.8	8.3	8.8
Conductivity, μmhos/cm	1800	1800	2060	2100
Calculated TDS, mg/l	1185	1200	1353	1431

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9208

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-8 S#1

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	5.3	0.264
Magnesium	8.5	0.699
Sodium	490	21.315
Carbonate	33	1.098
Bicarbonate	1,200	19.668
Chloride	2.8	0.078
Sulfate	12	0.270
Nitrate	0.2	---
Phosphate	Less than 0.1	---
Silicon dioxide	14	0.466
Iron	Less than 0.05	---
Fluoride	26	1.367
P. alkalinity, in terms of calcium carbonate	27	
MO alkalinity, in terms of calcium carbonate	985	
Hardness, in terms of calcium carbonate	48	
Total dissolved solids (calculated)	1,180	
Potassium	1.0	
Lithium	Less than 1.0	
Boron	1.1	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.8	

Specific conductance
1,800 micromhos per cc

pH 8.4

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

IS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9209

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-8 S#2

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	24	1.197
Magnesium	29	2.386
Sodium	490	21.315
Carbonate	36	1.198
Bicarbonate	1,210	19.831
Chloride	35	0.987
Sulfate	105	2.186
Nitrate	0.4	000
Phosphate	Less than 0.1	---
Silicon dioxide	18	0.599
Iron	Less than 0.05	---
Fluoride	15	0.789
P. alkalinity, in terms of calcium carbonate	30	
MO alkalinity, in terms of calcium carbonate	990	
Hardness, in terms of calcium carbonate	180	
Total dissolved solids (calculated)	1,340	
Potassium	1.0	
Lithium	Less than 1.0	
Boron	1.9	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.6	

Specific conductance
2,060 micromhos per cc

pH 8.3

MEMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #8 String #1 Environmental Sample
4-23-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.002	Terbium		Ruthenium		Vanadium	0.001
Thorium		Gadolinium		Molybdenum	0.008	Titanium	0.01
Bismuth		Europium		Niobium	0.002	Scandium	0.002
Lead	0.009	Samarium		Zirconium	0.002	Calcium	**
Thallium		Neodymium		Yttrium	≤0.001	Potassium	**
Mercury	*0.00013	Praseodymium		Strontium	0.8	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	***0.01	Phosphorus	0.06
Iridium		Barium	0.4	Selenium	***0.003	Silicon	**
Osmium		Cesium	0.01	Arsenic	0.02	Aluminum	0.01
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten	0.01	Tellurium		Gallium	0.002	Sodium	**
Tantalum		Antimony		Zinc	0.5	Fluorine	**
Hafnium		Tin		Copper	0.02	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.006	Nitrogen	NR
Ytterbium		Cadmium		Cobalt		Carbon	NR
Thulium		Silver		Iron	0.5	Boron	0.03
Erbium		Palladium		Manganese	0.05	Beryllium	
Holmium		Rhodium		Chromium	0.003	Lithium	0.03
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

*** Heterogeneous

Approved: M Jacobs

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Date: 20 May 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #8 String #2 Environmental Sample
4-24-75

IAD No.: 97-302-002-26

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	0.007	Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.01	Titanium	0.08
Bismuth		Europium		Niobium		Scandium	≤0.003
Lead	0.01	Samarium		Zirconium	0.003	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00023	Praseodymium		Strontium	3	Chlorine	**
Gold		Cerium		Rubidium	0.04	Sulfur	**
Platinum		Lanthanum	0.004	Bromine	0.05	Phosphorus	0.06
Iridium		Barium	0.6	Selenium	0.02	Silicon	**
Osmium		Cesium	0.04	Arsenic	0.03	Aluminum	0.04
Rhenium		Iodine	0.02	Germanium	0.002	Magnesium	**
Tungsten		Tellurium		Gallium	0.002	Sodium	**
Tantalum		Antimony		Zinc	1	Fluorine	**
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.001	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.2
Erbium		Palladium		Manganese	0.04	Beryllium	
Holmium		Rhodium		Chromium	0.02	Lithium	0.3
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported <0.001 µg/ml
* Flameless Atomic Absorption
** Not reported upon request

II B-136

Approved: M Jacobs

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5^{0}C, 920 µmhos, Environmental Sample 4-15-75	2		
2) SG #20 13^{0}C, 2800 µmhos, Environmental Sample 4-14-75	8		
3) SG #19 11^{0}C, 2825 µmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17^{0}C, 1800 µmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21^{0}C 65 µmhos Environmental Sample 4-11-75	8		
6) Cb-4 14^{0}C 850 µmhos Environmental Sample 4-13-75	3		
7) Cb-2 13^{0}C 1600 µmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14^{0}C 3800 µmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5^{0}C 1300 µmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	pCi/l					
		α Total	±	α Precision*	β Total	±	β Precision*
8166-1+	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6 ✓	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+✓	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

HAZE[illegible]ESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

Date: June 16, 1975
HRI Project No. 535
HRI Series No. 8166
Samples received: 5/6/75

REPORT OF ANALYSIS

Analysis No.	Sample Designation	pCi/1 Ra^{226}	±	Precision*
8166-1	SG#1, String #1, Reg. Envir. Samp. RAW, 4225 umhos, 4/29	0.0	±	0.4
-2	SG#1, String #2, Reg. Envir. Samp. RAW, 1800 umhos, 4/30	0.0	±	0.3
-4	SG#6, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 4/18	0.4	±	0.6
-7 ✓	SG#8, String #2, Reg. Envir. Samp. RAW, 2100 umhos, 4/24	0.0	±	0.4
-8	SG#10, String #1, Envir. Sample Metals + Acid Fixed, 50000 umhos, 5/1	16	±	4
-9	SG#10A, Envir. Sample Reg. RAW, 1400 umhos, 5/3	0.0	±	0.4
-10	SG#11, String #1, Reg. Envir. Samp. RAW, 45000 umhos	4.3	±	1.9
-11	SG#11, String #2, Reg. Envir. Samp. RAW, 1400 umhos, 5/2	0.0	±	0.4
-12	SG#11, String #3, Reg. Envir. Samp. RAW, 1800 umhos, 5/2	0.0	±	0.4
-14	SG#17, String #2, Reg. Envir. Samp. RAW, 47000 umhos, 4/28	0.2	±	0.4
-16	AT-1C, String #1, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.7	±	0.6
-17	AT-1C, String #2, Reg. Envir. Samp. RAW, 1175 umhos, 4/17	0.1	±	0.4
-18	AT-1C, String #3, Reg. Envir. Samp. RAW, 1300 umhos, 4/17	0.0	±	0.5
-19	A-5, Reg. Envir. Samp. RAW, 1425 umhos, 4/25	0.0	±	0.4
-21	A-8, Reg. Envir. Samp. RAW, 1300 umhos, 4/26	0.0	±	0.4
-22	A-9, Reg. Envir. Samp. RAW, 1175 umhos, 4/26	0.0	±	0.4
-23	A-10, Reg. Envir. Samp. RAW, 1500 umhos, 4/26	0.0	±	0.4
-24	A-11, Reg. Envir. Samp. RAW, 1450 umhos, 4/25	0.0	±	0.4
-25	A-12, Reg. Envir. Samp. RAW, 1600 umhos, 4/26	0.0	±	0.4

By John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

RECEIVED
JUN 19 197
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* ± Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96δ.

THE OIL SHALE CORPORATION
INTER OFFICE MEMORANDUM

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

LABORATORY DATA LETTER 75-97

FROM: C. M. Smits
TO: F. C. Haas
DATE: May 20, 1975
FILE NO.:
SUBJECT: Analysis of Organic Matter from C-b Core Holes, Submitted May 5, 1975

Project No. 197

SUMMARY

Two samples of organic matter from core holes Sorghum Gulch No. 8 and Sorghum Gulch No. 17 were submitted May 5, 1975. The materials were brown, waxy pastes with high water and solids contents. The two samples were quite similar, differing only in density. Some inspections were performed on one sample only. The material proved to be an oil, rather than a bitumen. Overall, the material gave the appearance of a topped, waxy crude. It is not known if this material actually came from the core holes or was an external contaminant.

INSPECTIONS PERFORMED

The samples, as submitted, were wet and dirty. The water was intimately mixed with the solid oil and was probably a valid part of the sample. The dirt, however, was mostly surface dirt and also contained a large quantity of nylon fishing line. After removing most of these surface solids , the inspections given in Table 1 were performed. The "weight percent solids", given in this table probably includes a substantial amount of dirt introduced during sampling.

The inspections in Tables 2 and 3 were performed on filtered dried samples. The relatively low densities, pour points, viscosities and the low oxygen content (1.05%) indicate that the materials were oils, rather than bitumens. The two samples appeared identical, except for their densities. The sample taken from SG-17 was much smaller than the SG-8 sample, and may have suffered more evaporative loss, since the sample vessels were not capped.

A D-1160 distillation was performed on the sample from SG-8. This distillation is detailed in Table 4 and Figure 1. Only about five percent of the material came overhead during the atmospheric distillation portion, but approximately one-fifth of this was caught in a dry ice/acetone trap, indicating there are some volatile components present. However, the large temperature gap between the IBP and the first five percent overhead, and the large amount of 940°F+ bottoms (40.31 volume percent) give this oil the appearance of a topped crude. Therefore, the possibility that this oil is a contaminant should be investigated.

If this material did indeed come from the C-b tract, it is significantly different from oil shale kerogen. It has less nitrogen, but somewhat more sulfur than shale oil, and a slightly lower C/H ratio. It is much more stable, thermally, cracking at 625°F bottoms versus 500°F for shale oil. The distillation cuts are not discolored by oxidation, and remain liquid up to 675°F (20 volume percent overhead). At higher temperatures the cuts become yellow waxes, and even the 940°F+ bottoms are waxy and pliable at room temperature.

Initially, the source of this oil should be confirmed. If it is a deposit on the C-b tract, additional, more careful sampling should be done. If the material is an external contaminant, the water samples taken at the same time may also be contaminated.

CMS/ec
Encs.

Approved (RMC) (MTA)

cc: B. L. Schulman
Laboratory Staff

Table 1

INSPECTIONS ON "AS RECEIVED" ORGANIC MATTER FROM C-b CORES

Inspection	SG-8	SG-17
Wt % H_2O	20.8	16.6
Wt % Solids (Excluding String and Gravel)	7.4	9.8

Table 2

INSPECTIONS ON DRIED, FILTERED ORGANIC MATTER FROM C-b CORES

Inspection	SG-8	SG-17
API @ 60°F	26.5°	24.6°
S. G. @ 60°F	0.8956 g/cc	0.9065 g/cc
Pour Point °F	100°	100°
Viscosity @ 122°F	169 cSt (783.8 SUS)	N. D.
Viscosity @ 210°F	21.87 cSt (106.3 SUS)	N. D.
Ash, wt %	0.34 %	0.16 %
Conradson Carbon Residue, wt %	3.76 %	3.75 %

ND = Not Determined

Table 3

ELEMENTAL ANALYSIS* OF ORGANIC MATTER FROM SG-8

Carbon, wt %	85.10
Hydrogen, wt %	12.44
Nitrogen, wt %	0.33
Oxygen, wt %	1.05
Sulfur, wt %	1.15
Total	100.07

* Performed by Galbraith Laboratories

Form AL-23 (8-73)

Table 4

D-1160 DATA REPORT

Dist. No. 766
Oil No. 238-2-1
Oil Source Sorghum Gulch No. 8, C-b Tract
Date Run May 12, 1975
Oil Type Unknown

	Dist. Range		Gravity (60/60)		Calc. Vol.		Σ Vol.
Cut	°F at 1 Atm.	Wt (g)	SG	API	(ml)	Vol. %	(%)
I.B.P.	152						
1	152-490	4.37	.8203	41.0	5.33	5.20	5.20
2	490-560	4.58	.8280	39.4	5.53	5.39	10.59
3	560-623	4.18	.8285	39.3	5.05	4.92	15.51
4	623-675	4.36	.8363	37.7	5.21	5.08	20.59
5	675-725	4.39	.8478	35.4	5.18	5.05	25.64
6	725-773	4.30	.8612	32.8	4.99	4.86	30.50
7	773-816	4.64	.8681	31.5	5.35	5.22	35.72
8	816-860	5.30	.8800	29.3	6.02	5.87	41.59
9	860-878	5.87	.8871	28.0	6.62	6.45	48.04
10	878-912	4.72	.8973	26.2	5.26	5.13	53.17
11	912-940	4.46	.8990	25.9	4.96	4.84	58.01
	Subtotals	51.17			59.50		
	940+	40.61	.9820	12.6	41.35	40.31	98.32
	Totals	91.78			100.85		

Charge Gravity	26.5	°API	.8956	g/cc
Bottoms Gravity	12.6	°API	.9820	g/cc

Material Balance:

Charge	91.86	g.	102.57	ml.
Recovery	91.78	g.	100.85	ml.
L & H	0.08	g.	1.72	ml.

Comments:

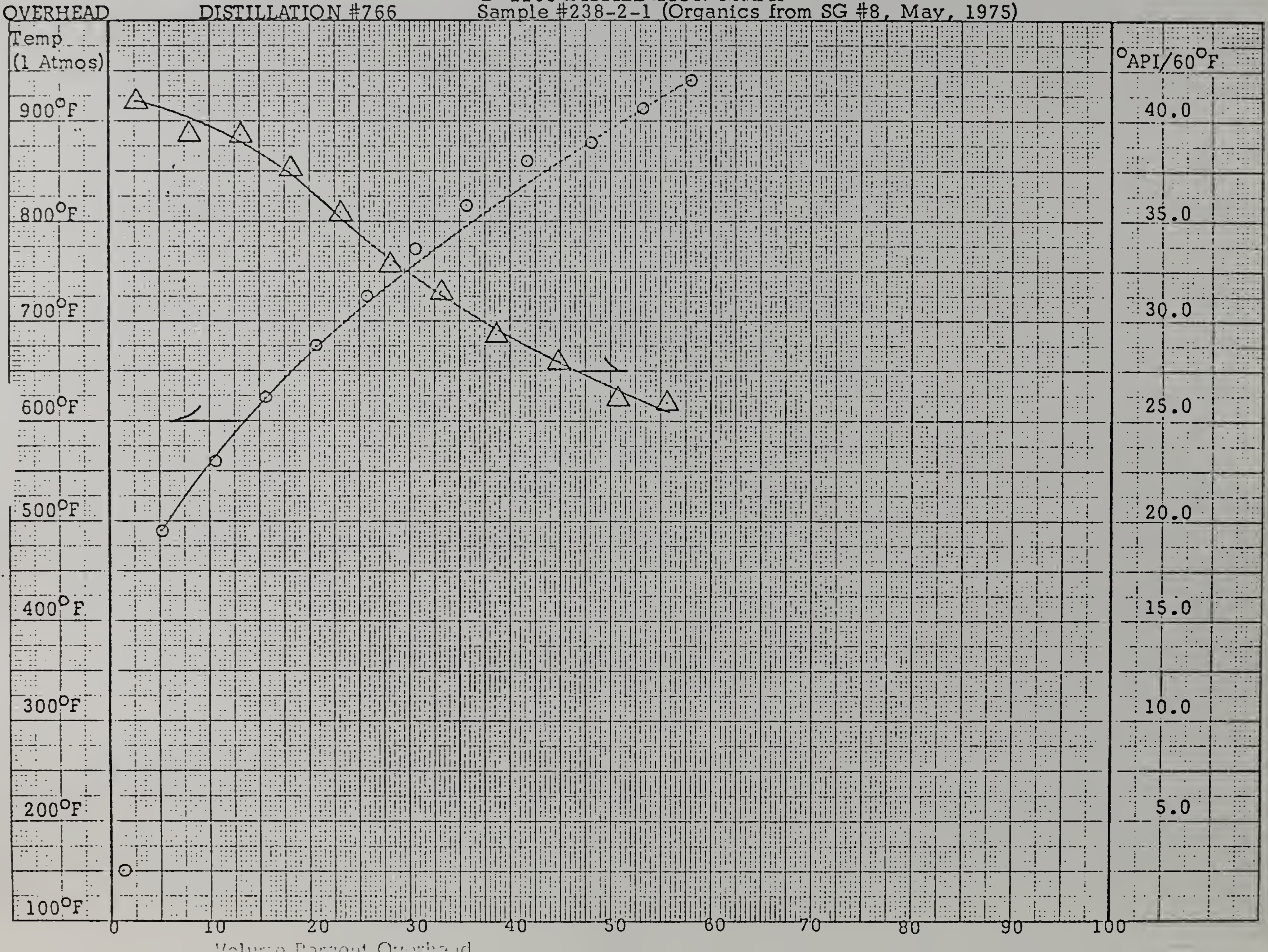
Cut #1 contains 0.92 g of Cold trap material (≈1.36 volume percent)

K+E 10 X 10 TO THE CENTIMETER 46 1510
18 X 25 CM. MADE IN U.S.A.
KEUFFEL & ESSER CO.

Fi e 1

D-1160 DISTILLATION GRAPH
Sample #238-2-1 (Organics from SG #8, May, 1975)

DISTILLATION #766



J. R. Matis

LOS ANGELES ☐
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NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-103

FROM:	F. C. Haas	**DATE:**	June 17, 1975
		FILE NO.:	5100-3
TO:	File	**SUBJECT:**	Analyses of Environmental Water Samples from Core Hole SG-9 - Project 197

Two environmental water samples were taken from Core Hole SG-9, C-b tract, on 4-11-75. Samples were taken from No. 1 and No. 2 strings. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado and TOSCO, Rocky Flats. Minor constituents, total organic carbon, and trace metals were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado.

There are no major discrepancies in the major constituent analyses.

Total organic carbon in both samples was less than 10 milligrams per liter.

Gross alpha radiation in both samples was greater than 4 pCi per liter; Ra_{226} was determined and none was found.

FCH/dt
Encs

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski
J. R. Matis
P. Boileau

ENVIRONMENTAL SAMPLES FROM CORE HOLE SG-9

(Major Constituent Analyses)

	String No. 1		String No. 2	
Component	Ind.	TOSCO	Ind.	TOSCO
Sodium, mg/l	790	833	230	220
Potassium, mg/l	16	7	16	5
Calcium, mg/l	9	4	72	84
Magnesium, mg/l	3.3	4	110	150
Lithium, mg/l	1.3	1.5	<1	<0.5
Sulfate, mg/l	57	57	430	523
Carbonate, mg/l	67	26	<0.1	<1
Bicarbonate, mg/l	1640	1720	685	820
Chloride, mg/l	84	138	19	22
Fluoride, mg/l	25	20	1.3	1.5
Borate, mg/l	17	35	1.6	1.7
$\sum$Cations, meq/l	35.67	37.14	23.06	26.24
$\sum$Anions, meq/l	34.39	36.02	20.83	25.08
% Difference	1.8	1.5	5.1	2.3
Silica, mg/l	14	12	32	22
pH	8.3	8.6	8.0	8.1
Conductivity µmhos/cm	3200	3100	1840	1950
Calculated TDS, mg/l	1887	1980	1248	1431

THE INDUSTRIAL LABORATORIES COMPANY
Analytical and Consulting Chemists
2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
TELEPHONE 455-3041

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9109

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-9 String 1 4/11/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	9	0.449
Magnesium	3.3	0.271
Sodium	790	34.365
Carbonate	67	2.231
Bicarbonate	1,640	26.879
Chloride	84	2.369
Sulfate	57	1.186
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	14	0.466
Iron	Less than 0.05	---
Fluoride	25	1.315
P. alkalinity, in terms of calcium carbonate	55	
MO alkalinity, in terms of calcium carbonate	285	
Hardness, in terms of calcium carbonate	36	
Total dissolved solids (calculated)	1,850	
Potassium	16	
Lithium	1.3	
Boron	4.3	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	6.8	

pH 8.3

Specific conductance
3,200 micromhos per cc

EMBERS OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

IS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211

TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9113

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-9 String 2 4/11/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	72	3.592
Magnesium	110	9.050
Sodium	230	10.005
Carbonate	Less than 0.1	---
Bicarbonate	685	11.227
Chloride	19	0.535
Sulfate	430	8.952
Nitrate	0.4	---
Phosphate	0.4	---
Silicon dioxide	32	1.065
Iron	Less than 0.05	---
Fluoride	1.3	0.068
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	560	
Hardness, in terms of calcium carbonate	640	
Total dissolved solids (calculated)	1,230	
Potassium	16	
Lithium	Less than 1.0	
Boron	0.4	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.8	

pH 8.0

Specific conductance
1,840 micromhos per cc

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

[illegible] OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

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JUN 5 197

TOSCO/GOLD

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #9 String 1 21°C 6500 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.004
Thorium		Gadolinium		Molybdenum	0.04	Titanium	0.3
Bismuth		Europium		Niobium		Scandium	0.002
Lead	0.01	Samarium		Zirconium	0.005	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00019	Praseodymium		Strontium	0.2	Chlorine	**
Gold		Cerium		Rubidium	0.01	Sulfur	**
Platinum		Lanthanum		Bromine	0.2	Phosphorus	0.03
Iridium		Barium	0.08	Selenium		Silicon	**
Osmium		Cesium	0.05	Arsenic	0.006	Aluminum	0.05
Rhenium		Iodine	0.1	Germanium		Magnesium	**
Tungsten	0.008	Tellurium		Gallium	0.002	Sodium	**
Tantalum		Antimony	0.01	Zinc	0.05	Fluorine	**
Hafnium		Tin	0.005	Copper	0.009	Oxygen	NR
Lutetium		Indium	STD	Nickel	***0.03	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	0.002	Carbon	NR
Thulium		Silver		Iron	0.07	Boron	1
Erbium		Palladium		Manganese	***0.02	Beryllium	
Holmium		Rhodium		Chromium	0.02	Lithium	8
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported ≤0.002 μg/ml
* Flameless Atomic Absorption
** Not reported upon request

***Heterogeneous

Approved:

RECEIVED
JUN 5 1975
TOSCO/GOLDE

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #9 String 2 17°C 1800 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.02	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	0.002
Lead	0.02	Samarium		Zirconium	0.001	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00012	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum		Bromine	0.03	Phosphorus	0.4
Iridium		Barium	0.1	Selenium	0.001	Silicon	**
Osmium		Cesium	0.003	Arsenic	0.01	Aluminum	0.05
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	0.001	Sodium	**
Tantalum		Antimony	0.02	Zinc	1	Fluorine	**
Hafnium		Tin		Copper	0.05	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.04	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	0.003	Carbon	NR
Thulium		Silver		Iron	0.1	Boron	0.03
Erbium		Palladium		Manganese	0.1	Beryllium	
Holmium		Rhodium		Chromium	0.005	Lithium	0.06
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported <0.001 μg/ml
* Flameless Atomic Absorption

Approved:

** Not reported upon request

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 220 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 00601 · AREA CODE 312 720-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09		TOC* mg/l	DOC* mg/l	SUSP**
1)	SG #21 13.5°C, 920 µmhos, Environmental Sample 4-15-75	2		
2)	SG #20 13°C, 2800 µmhos, Environmental Sample 4-14-75	8		
[illegible])	SG #19 11°C, 2825 µmhos, Environmental Sample 4-13-75	7		
4)	SG #9 String 2 17°C, 1800 µmhos Environmental Sample 4-11-75	5		
5)	SG #9 String 1 21°C 65 µmhos Environmental Sample 4-11-75	8		
6)	Cb-4 14°C 850 µmhos Environmental Sample 4-13-75	3		
7)	Cb-2 13°C 1600 µmhos, Environmental Sample 4-14-75	4		
8)	Cb-1 14°C 3800 µmhos, Environmental Sample 4-12-75	6		
9)	A-2 10.5°C 1300 µmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26				
1)	AT-1C String #1 Environmental Sample 4-17-75	4	5	
2)	AT-1C String #3 Environmental Sample 4-17-75	1	1	
3)	AT-1C String #2 Environmental Sample 4-17-75	2	2	
4)	SG #1 String #1 Environmental Sample 4-29-75	6	4	
5)	SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6)	SG #1 String #1 Environmental Sample 4-18-75	6	7	
7)	SG #6 String #2 Environmental Sample 4-18-75	7		
8)	SG #6 String #3 Environmental Sample 4-18-75	9		
9)	SG #8 String #1 Environmental Sample 4-23-75	5		
10)	SG #8 String #2 Environmental Sample 4-24-75	3		

HAZEN RESEARCH, INC.
4601 I[illegible]ana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 16, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

II B-153

Analysis No.	Sample Designation	pCi/l α Total ± α Precision*	 β Total ± β Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	7.6 ± 3.8	0 ± 14
-2	SG#9-String 1-6500nmhos-Environ. Samp.-4/11	6.4 ± 4.3	0 ± 25
-3	Cb1-3800nmhos-Environ. Samp.-4/12-Fixed	18 ± 6	0 ± 23
-4	SG#19-2825nmhos-Environ. Samp.-4/13	20 ± 7	0 ± 22
-5	SG#20-2800nmhos-Environ. Samp.-4/14	12 ± 6	0 ± 21
-6	SG#21-920nmhos-Environ. Samp.-4/15	9.2 ± 3.2	0 ± 13
-7	Cb4-850nmhos-Envifon. Samp.-4/13-Fixed	16 ± 4	0 ± 13
-8	A2-1300nmhos-Environ. Samp.-4/14-Fixed	6.3 ± 3.1	0 ± 13
-9	Cb2-1600nmhos-Environ. Samp.-4/14-Raw	12 ± 4	0 ± 13

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96$_\sigma$.

Note: All samples will be analyzed for Ra^{226}.

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MAY 19 1975
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HAZEN RESEARCH, INC.
4601 Indiana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

June 6, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Addition to Report dated 5/16/75

Analysis No.	Sample Designation	Ra^{226} pCi/l	±	Precision*
8123-1 ✓	SG#9-String 2-Environmental Samp.-4/11	0.0	±	0.3
-2 ✓	SG#9-String 1-6500umhos-Environ. Samp.-4/11	0.0	±	0.4
-3	Cb1-3800umhos-Environ. Samp.-4/12-Fixed	0.1	±	0.4
-4	SG#19-2825umhos-Environ. Samp.-4/13	0.3	±	0.5
-5	SG#20-2800umhos-Environ. Samp.-4/14	0.1	±	0.5
-6	SG#21-920umhos-Environ. Samp.-4/15	0.0	±	0.3
-7	Cb4-850umhos-Environ. Samp.-4/13-Fixed	0.1	±	0.4
-8	A2-1300umhos-Environ. Samp.-4/14-Fixed	0.0	±	0.3
-9	Cb2-1600umhos-Environ. Samp.-4/14-Raw	0.0	±	0.3

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

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JUN 9 1975
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GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION
INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-104

FROM:	F. C. Haas	**DATE:**	June 17, 1975
		FILE NO.:	5100-3
TO:	File	**SUBJECT:**	Analyses of Environmental Water Samples from Core Holes SG-18 and SG-19 Project No. 197

Two environmental water samples were taken from Core Holes SG-18 and SG-19, C-b tract. Samples were taken from SG-18 on 5-3-75 and from SG-19 on 4-13-75. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, total organic carbon, and trace metals were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado.

There are no major discrepancies in the major constituent analyses.

Total organic carbon in both samples was less than 10 milligrams per liter.

Gross alpha radiation in SG-19 was greater than 4 pCi per liter; Ra_{226} was determined and was found to be less than 4 pCi per liter.

FCH/dt
Encs

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski
J. R. Matis
P. Boileau

ENVIRONMENTAL SAMPLES FROM CORE HOLES SG-18 AND SG-19

(Major Constituent Analyses)

Component	SG-18		SG-19	
	Ind.	TOSCO	Ind.	TOSCO
Sodium, mg/l	166	146	800	780
Potassium, mg/l	<1	0.6	2.1	1
Calcium, mg/l	28	29	10	5
Magnesium, mg/l	42	37	2.5	3
Lithium, mg/l	<1	<0.5	<1	<0.5
Sulfate, mg/l	140	132	10	23
Carbonate, mg/l	12	18	55	24
Bicarbonate, mg/l	475	458	1900	1958
Chloride, mg/l	12	4	7.2	11
Fluoride, mg/l	4	5	24	22
Borate, mg/l	3	6	6	5
ΣCations, meq/l	12.07	10.86	35.54	34.43
ΣAnions, meq/l	11.51	11.37	34.80	34.96
% Difference	2.4	2.3	1.1	0.8
Silica, mg/l	27	21	11	9
pH	8.3	8.7	8.2	8.6
Conductivity, µmhos/cm	930	900	2800	2825
Calculated TDS, mg/l	663	623	1859	1842

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3041

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/7/75
DATE REPORTED: 5/20/75

LAB. NUMBER: 9221

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

18

SAMPLE MARKED: SG 18a

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	28	1.397
Magnesium	42	3.455
Sodium	166	6.960
Carbonate	12	0.399
Bicarbonate	475	7.785
Chloride	12	0.338
Sulfate	140	2.914
Nitrate	0.10	---
Phosphate	0.2	---
Silicon dioxide	27	0.899
Iron	Less than 0.05	---
Fluoride	Less than 0.1	
P. alkalinity, in terms of calcium carbonate	9.8	
MO alkalinity, in terms of calcium carbonate	390	
Hardness, in terms of calcium carbonate	240	
Total dissolved solids (calculated)	650	
Potassium	Less than 1.0	
Lithium	Less than 1.0	
Boron	0.70	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.95	

Specific conductance
930 micromhos per cc

pH 8.3

MEMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul
CHEMIST

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211

TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9110

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

AMPLE MARKED: SG-19 4/13/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	10	0.499
Magnesium	2.5	0.205
Sodium	800	34.800
Carbonate	55	1.831
Bicarbonate	1,900	31.141
Chloride	7.2	0.203
Sulfate	10	0.208
Nitrate	Less than 0.1	---
Phosphate	Less than 0.1	---
Silicon dioxide	11	0.366
Iron	Less than 0.05	---
Fluoride	24	1.262
P. alkalinity, in terms of calcium carbonate	45	
MO alkalinity, in terms of calcium carbonate	430	
Hardness, in terms of calcium carbonate	36	
Total dissolved solids (calculated)	1,850	
Potassium	2.1	
Lithium	Less than 1.0	
Boron	1.6	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.1	

pH 8.2

Specific conductance
2,800 micromhos per cc

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY

CHEMIST

IS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, CO 80401

Date: 20 May 75

Analyst: Sandra Sweeney

P. O. No.:

Sample No.: Sg #18 Environmental Sample 5-3-75

IAD No.: 97-302-002-26

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	≤0.002
Thorium		Gadolinium		Molybdenum	0.01	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00034	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.01	Sulfur	**
Platinum		Lanthanum		Bromine	0.008	Phosphorus	0.02
Iridium		Barium	0.04	Selenium	0.004	Silicon	**
Osmium		Cesium	≤0.002	Arsenic	0.006	Aluminum	0.03
Rhenium		Iodine	≤0.002	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium		Sodium	**
Tantalum		Antimony		Zinc	0.7	Fluorine	**
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.01	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver		Iron	0.1	Boron	0.01
Erbium		Palladium		Manganese	0.03	Beryllium	
Holmium		Rhodium		Chromium	0.006	Lithium	0.03
Dysprosium						Hydrogen	NR

NR – Not Reported
All elements not reported ≤0.002 μg/ml
*Flameless Atomic Absorption
**Not reported upon request

Approved:

JUN 5 19
TOSCO/GOLD

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

#19

Sample No.: SG #9 11°C 2825 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	***0.005
Thorium		Gadolinium		Molybdenum	0.008	Titanium	0.1
Bismuth		Europium		Niobium		Scandium	≤0.002
Lead	0.009	Samarium		Zirconium	0.009	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00026	Praseodymium		Strontium	0.4	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.008	Phosphorus	0.03
Iridium		Barium	0.2	Selenium		Silicon	**
Osmium		Cesium	0.01	Arsenic	0.002	Aluminum	0.05
Rhenium		Iodine	0.001	Germanium		Magnesium	**
Tungsten	0.01	Tellurium		Gallium	0.001	Sodium	**
Tantalum		Antimony	0.001	Zinc	2	Fluorine	**
Hafnium		Tin		Copper	0.05	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.002	Carbon	NR
Thulium		Silver	0.001	Iron	0.5	Boron	0.1
Erbium		Palladium		Manganese	0.01	Beryllium	
Holmium		Rhodium		Chromium	0.006	Lithium	0.03
Dysprosium						Hydrogen	NR

II B-160

NR – Not Reported
All elements not reported ≤0.001 μg/ml
* Flameless Atomic Absorption
** Not reported upon request
*** Heterogeneous

Approved: M L Jacobs

IAD #97-302-002-26 Con't	TOC* mg/l	DOC* mg/l	SUSP**
11) SG #10A Environmental Sample 5-3-75	<1		
12) SG #10 String #1 Environmental Sample 5-1-75	26	25	17
13) SG #11String #2 Environmental Sample 5-2-75	2	3	
14) SG #11 String #3 Environmental Sample 5-2-75	3	4	
15) SG #11 String #1 Environmental Sample 5-2-75	25	26	19
16) SG #17 String #1 Environmental Sample 4-26-75	18	20	16
17) SG #17 String #2 Environmental Sample 4-28-75	4	9	
✓18) SG #18 Environmental Sample 5-3-75	<1	<1	
19) Alluvial Well #1 Environmental Sample 4-23-75	8		
20) A-5 Environmental Sample 4-25-75	3	5	
21) A-7 Environmental Sample 4-26-75	9		
22) A-8 Environmental Sample 4-26-75	9		
23) A-9 Environmental Sample 4-26-75	2	2	
24) A-10 Environmental Sample 4-26-75	7		
25) A-11 Environmental Sample 4-26-75	1	1	
26) A-12 Environmental Sample 4-26-75	7		
IAD Standard 2.5 mg/l in 5% $NaHCO_3$	3		
IAD Standard 2.5 mg/l	3		
IAD Standard 50 mg/l in 5% $NaHCO_3$	50		
IAD Standard 50 mg/l	45		
IAD Standard 10 mg/l	10		
IAD Standard 20 mg/l	15		

* Test performed on samples marked "Regular" Outside lab.

* SUSP - Material remaining on glass filter was experimentally run for organic carbon.

M L Jacobs
M. L. Jacobs, Ph.D.
Divisional Manager

MLJ/dh

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
1) SG #21 13.5°C, 920 μmhos, Environmental Sample 4-15-75	2		
2) SG #20 13°C, 2800 μmhos, Environmental Sample 4-14-75	8		
3) SG #19 11°C, 2825 μmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 μmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 μmhos Environmental Sample 4-11-75	8		
6) Cb-4 14°C 850 μmhos Environmental Sample 4-13-75	3		
7) Cb-2 13°C 1600 μmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14°C 3800 μmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5°C 1300 μmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

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4601 Indiana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 16, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Analysis No.	Sample Designation	pCi/l α Total ± α Precision*	 β Total ± β Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	7.6 ± 3.8	0 ± 14
-2	SG#9-String 1-6500nmhos-Environ. Samp.-4/11	6.4 ± 4.3	0 ± 25
-3	Cb1-3800nmhos-Environ. Samp.-4/12-Fixed	18 ± 6	0 ± 23
-4 ✓	SG#19-2825nmhos-Environ. Samp.-4/13	20 ± 7	0 ± 22
-5	SG#20-2800nmhos-Environ. Samp.-4/14	12 ± 6	0 ± 21
-6	SG#21-920nmhos-Environ. Samp.-4/15	9.2 ± 3.2	0 ± 13
-7	Cb4-850nmhos-Envifon. Samp.-4/13-Fixed	16 ± 4	0 ± 13
-8	A2-1300nmhos-Environ. Samp.-4/14-Fixed	6.3 ± 3.1	0 ± 13
-9	Cb2-1600nmhos-Environ. Samp.-4/14-Raw	12 ± 4	0 ± 13

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

Note: All samples will be analyzed for Ra^{226}.

RECEIVED
MAY 19 1975
TOSCO/GOLDEN

HAZEN RESEARCH, INC.
4601 Ind[illegible]na Street
Golden, Colorado 80401

Mr. Frank Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 29, 1975
HRI Project No. 535
HRI Series No. 8166
Samples Rec'd. 5/6/75

Analysis No.	Sample Designation	pCi/l α Total	±	α Precision*	β Total	±	β Precision*
8166-1+	SG#1,String#1,4225umhos,4/29	23	±	11	0	±	41
-2+	SG#1,String#2,1300umhos,4/30	8.1	±	3.2	0	±	10
-3	SG#6,String#1,1350umhos,4/18	3.5	±	3.1	12	±	12
-4+	SG#6,String#2,1400umhos,4/18	6.0	±	2.9	0	±	11
-5	SG#6,String#3,1600umhos,4/18	0.4	±	2.2	0	±	10
-6	SG#8,String#1,1900umhos,4/23	2.8	±	3.0	0	±	10
-7+	SG#8,String#2,2100umhos,4/24	11	±	5	0	±	21
-8+	SG#10,String#1,50000umhos	320	±	150	<0.1	±	**
-9+	SG#10A,1400umhos,5/3	6.1	±	2.9	0	±	11
-10+	SG#11,String#1,45000umhos	460	±	170	<0.1	±	**
-11+	SG#11,String#2,1400umhos,5/2	7.8	±	3.3	0	±	10
-12+	SG#11,String#3,1800umhos,5/2	7.2	±	3.7	0	±	11
-13	SG#17,String#1,35000umhos,4/26	3.1	±	44	<0.1	±	**
-14+	SG#17,String#2,4700umhos,4/28	21	±	10	0	±	36
-15✓	SG#18,1000umhos,5/3	4.0	±	2.3	0	±	10
-16+	AT-1C,String#1,1175umhos,4/17	10	±	4	0	±	11
-17+	AT-1C,String#2,1175umhos,4/17	7.2	±	3.1	0	±	11
-18+	AT-1C,String#3,1300umhos,4/17	7.7	±	3.2	0	±	11
-19+	A-5,1425umhos,4/25	6.2	±	3.3	0	±	13
-20	A-7,1200umhos,4/26	4.0	±	2.6	0	±	13

HAZEN RESEARCH, INC.
4601 In[illegible]ana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

June 6, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Addition to Report dated 5/16/75

Analysis No.	Sample Designation	Ra^{226} pCi/l	±	Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	0.0	±	0.3
-2	SG#9-String 1-6500umhos-Environ. Samp.-4/11	0.0	±	0.4
-3	Cb1-3800umhos-Environ. Samp.-4/12-Fixed	0.1	±	0.4
-4 ✓	SG#19-2825umhos-Environ. Samp.-4/13	0.3	±	0.5
-5	SG#20-2800umhos-Environ. Samp.-4/14	0.1	±	0.5
-6	SG#21-920umhos-Environ. Samp.-4/15	0.0	±	0.3
-7	Cb4-850umhos-Environ. Samp.-4/13-Fixed	0.1	±	0.4
-8	A2-1300umhos-Environ. Samp.-4/14-Fixed	0.0	±	0.3
-9	Cb2-1600umhos-Environ. Samp.-4/14-Raw	0.0	±	0.3

By: ______________________
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

RECEIVED
JUN 9 1975
TOSCO/GOLDE

THE OIL SHALE CORPORATION
INTER OFFICE MEMORANDUM

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

LABORATORY DATA LETTER 75-105

FROM: F. C. Haas
TO: File
DATE: June 17, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Environmental Water Samples from Core Holes SG-20 and SG-21

Project 197

Two environmental water samples were taken from Core Holes SG-20 and SG-21, C-b tract. Samples were taken from SG-20 on June 14, 1975, and from SG-21 on June 15, 1975. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Minor constituents, total organic carbon and trace metals were done by Commercial Testing & Engineering, Golden, Colorado. Radioactivity was done by Hazen Research, Inc., Golden, Colorado.

There are no major discrepancies in the major constituents analyses.

Total organic carbon in both samples was less than 10 mg/liter.

Gross alpha radiation in both samples was greater than 4 pCi/liter; Ra_{226} was determined and was found to be less than 4 pCi/liter.

FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
H. M. Spence
B. L. Schulman
A. W. Schillinger
T. H. Cleveland
M. W. Legatski (ARCO)
J. R. Matis (ARCO)
P. Boileau (ARCO)

Table 1

ENVIRONMENTAL SAMPLES FROM CORE HOLES SG-20 AND SG-21 (MAJOR CONSTITUENT ANALYSES)

	SG-20		SG-21	
Component	Industrial	TOSCO	Industrial	TOSCO
Sodium, mg/l	760	767	200	187
Potassium, mg/l	2.1	1	2.1	0.5
Calcium, mg/l	7.4	4	30	19
Magnesium, mg/l	3.3	3	21	25
Lithium, mg/l	<1	<0.5	<1	<0.5
Sulfate, mg/l	10	27	110	80
Carbonate, mg/l	85	32	24	9
Bicarbonate, mg/l	1790	2002	470	500
Chloride, mg/l	11	13	2.9	2
Fluoride, mg/l	25	23	8.6	9
Borate, mg/l	6.2	4	1.6	1.2
Σ Cations, meq/l	34.22	33.82	11.98	11.15
Σ Anions, meq/l	34.16	36.12	11.37	10.72
% Difference	<0.1	3.2	2.6	2.0
Silica, mg/l	10	7	21	15
pH	8.4	8.7	8.2	8.5
Conductivity, µmhos/cm	2900	2800	1020	1000
Calculated TDS, mg/l	1797	1862	652	593

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211
ANALYSIS REPORT

TELEPHONE 455-3641

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9111

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-20 4/14/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	7.4	0.369
Magnesium	3.3	0.271
Sodium	760	33.060
Carbonate	85	2.830
Bicarbonate	1,790	29.338
Chloride	11	0.310
Sulfate	10	0.208
Nitrate	0.9	---
Phosphate	Less than 0.1	---
Silicon dioxide	10	0.333
Iron	Less than 0.05	---
Fluoride	25	1.315
P. alkalinity, in terms of calcium carbonate	70	
MO alkalinity, in terms of calcium carbonate	1,470	
Hardness, in terms of calcium carbonate	32	
Total dissolved solids (calculated)	1,790	
Potassium	2.1	
Lithium	Less than 1.0	
Boron	1.6	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	1.4	

pH 8.4

Specific conductance
2,900 micromhos per cc

ME[illegible]S OF:
AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
CHEMIST

HIS REPORT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, FOR ADVERTISING PURPOSES WITHOUT OBTAINING PRIOR WRITTEN AUTHORIZATION

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

2600 WEST 29TH AVENUE
DENVER, COLORADO 80211

TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY

DATE RECEIVED: 5/2/75
DATE REPORTED: 5/9/75

LAB. NUMBER: 9112

SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

SAMPLE MARKED: SG-21

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	30	1.497
Magnesium	21	1.727
Sodium	200	18.700
Carbonate	24	0.799
Bicarbonate	470	7.703
Chloride	2.9	0.081
Sulfate	110	2.290
Nitrate	0.6	---
Phosphate	0.2	---
Silicon dioxide	21	0.699
Iron	Less than 0.05	---
Fluoride	8.6	0.452
P. alkalinity, in terms of calcium carbonate	20	
MO alkalinity, in terms of calcium carbonate	385	
Hardness, in terms of calcium carbonate	160	
Total dissolved solids (calculated)	650	
Potassium	2.1	
Lithium	Less than 1.0	
Boron	0.4	
Hexavalent chromium	Less than 0.01	
Hydroxide	Less than 0.1	
Ammonia-nitrogen	0.4	

pH 8.2

Specific conductance
1,020 micromhos per cc

EMBERS OF:

AMERICAN ASS'N OF CEREAL CHEMISTS
AMERICAN CHEMICAL SOCIETY
AMERICAN OIL CHEMISTS' SOCIETY
ASS'N OF OFFICIAL RACING CHEMISTS
BAKERY ENGINEERS OF AMERICA
INSTITUTE OF FOOD TECHNOLOGY
SIGMA XI

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Vela
CHEMIST

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JUN 5 1975
TOSCO/GOLDE

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #20 13°C 2800 μmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN μg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	≤0.001
Thorium		Gadolinium		Molybdenum	0.03	Titanium	0.2
Bismuth		Europium		Niobium		Scandium	≤0.003
Lead	0.008	Samarium		Zirconium	0.01	Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00022	Praseodymium		Strontium	0.7	Chlorine	**
Gold		Cerium		Rubidium	0.02	Sulfur	**
Platinum		Lanthanum		Bromine	0.01	Phosphorus	0.04
Iridium		Barium	0.3	Selenium	0.002	Silicon	**
Osmium		Cesium	0.01	Arsenic	0.004	Aluminum	0.04
Rhenium		Iodine	0.002	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	≤0.001	Sodium	**
Tantalum		Antimony		Zinc	0.04	Fluorine	**
Hafnium		Tin		Copper	0.03	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.03	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤0.004	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.2
Erbium		Palladium		Manganese	0.007	Beryllium	
Holmium		Rhodium		Chromium	0.002	Lithium	0.02
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported <0.001 μg/ml
* Flameless Atomic Absorption

Approved:

** Not reported upon request

JUN 5 197

TOSCO/GOLD

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434
Reply to INSTRUMENTAL ANALYSIS DIVISION, 14335 WEST 44TH AVENUE, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

To: Mr. Frank Haas
The Oil Shale Corp.
18200 West Hiway 72
Golden, CO 80401

Date: 3 June 75

Analyst: Rhonda Dawkins

P. O. No.:

Sample No.: SG #21 13.5°C 920 µmhos
Revised

IAD No.: 97-293-002-09

CONCENTRATION IN µg/ml

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium		Terbium		Ruthenium		Vanadium	0.003
Thorium		Gadolinium		Molybdenum	0.02	Titanium	0.03
Bismuth		Europium		Niobium		Scandium	0.006
Lead	0.01	Samarium		Zirconium		Calcium	**
Thallium		Neodymium		Yttrium		Potassium	**
Mercury	*0.00003	Praseodymium		Strontium	2	Chlorine	**
Gold		Cerium		Rubidium	0.006	Sulfur	**
Platinum		Lanthanum		Bromine	0.02	Phosphorus	0.07
Iridium		Barium	0.1	Selenium	0.003	Silicon	**
Osmium		Cesium	0.002	Arsenic	0.006	Aluminum	0.06
Rhenium		Iodine	0.003	Germanium		Magnesium	**
Tungsten		Tellurium		Gallium	0.002	Sodium	**
Tantalum		Antimony		Zinc	0.1	Fluorine	**
Hafnium		Tin		Copper	0.005	Oxygen	NR
Lutetium		Indium	STD	Nickel	0.02	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	$\leq$0.003	Carbon	NR
Thulium		Silver		Iron	0.3	Boron	0.01
Erbium		Palladium		Manganese	0.03	Beryllium	
Holmium		Rhodium		Chromium	0.003	Lithium	0.007
Dysprosium						Hydrogen	NR

NR — Not Reported
All elements not reported <0.002 µg/ml
* Flameless Atomic Absorption

Approved:

**Not reported upon request

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

Reply to
Instrumental Analysis Division
14335 West 44th Avenue
Golden, Colorado 80401

Phone: 303-278-9521

13 June 75

Mr. Frank Haas
The Oil Shale Corporation
18200 West Hiway 72
Golden, Colorado 80401

Re: IAD #97-293-002-09
#97-302-002-26

Analytical Report

IAD #97-293-002-09	TOC* mg/l	DOC* mg/l	SUSP**
✓1) SG #21 13.5°C, 920 µmhos, Environmental Sample 4-15-75	2		
✓2) SG #20 13°C, 2800 µmhos, Environmental Sample 4-14-75	8		
3) SG #19 11°C, 2825 µmhos, Environmental Sample 4-13-75	7		
4) SG #9 String 2 17°C, 1800 µmhos Environmental Sample 4-11-75	5		
5) SG #9 String 1 21°C 65 µmhos Environmental Sample 4-11-75	8		
6) Cb-4 14°C 850 µmhos Environmental Sample 4-13-75	3		
7) Cb-2 13°C 1600 µmhos, Environmental Sample 4-14-75	4		
8) Cb-1 14°C 3800 µmhos, Environmental Sample 4-12-75	6		
9) A-2 10.5°C 1300 µmhos, Environmental Sample 4-14-75	2		
IAD #97-302-002-26			
1) AT-1C String #1 Environmental Sample 4-17-75	4	5	
2) AT-1C String #3 Environmental Sample 4-17-75	1	1	
3) AT-1C String #2 Environmental Sample 4-17-75	2	2	
4) SG #1 String #1 Environmental Sample 4-29-75	6	4	
5) SG #1 String #2 Environmental Sample 4-30-75	<1	<1	
6) SG #1 String #1 Environmental Sample 4-18-75	6	7	
7) SG #6 String #2 Environmental Sample 4-18-75	7		
8) SG #6 String #3 Environmental Sample 4-18-75	9		
9) SG #8 String #1 Environmental Sample 4-23-75	5		
10) SG #8 String #2 Environmental Sample 4-24-75	3		

HAZEN RESEARCH, INC.
4601 In[illegible]na Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

May 16, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Analysis No.	Sample Designation	pCi/l α Total±Precision* α	 β Total±Precision* β
8123-1	SG#9-String 2-Environmental Samp.-4/11	7.6 ± 3.8	0 ± 14
-2	SG#9-String 1-6500nmhos-Environ. Samp.-4/11	6.4 ± 4.3	0 ± 25
-3	Cb1-3800nmhos-Environ. Samp.-4/12-Fixed	18 ± 6	0 ± 23
-4	SG#19-2825nmhos-Environ. Samp.-4/13	20 ± 7	0 ± 22
-5✓	SG#20-2800nmhos-Environ. Samp.-4/14	12 ± 6	0 ± 21
-6✓	SG#21-920nmhos-Environ. Samp.-4/15	9.2 ± 3.2	0 ± 13
-7	Cb4-850nmhos-Envifon. Samp.-4/13-Fixed	16 ± 4	0 ± 13
-8	A2-1300nmhos-Environ. Samp.-4/14-Fixed	6.3 ± 3.1	0 ± 13
-9	Cb2-1600nmhos-Environ. Samp.-4/14-Raw	12 ± 4	0 ± 13

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96_σ.

Note: All samples will be analyzed for Ra^{226}.

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HAZEN RESEARCH, INC.
4601 In[illegible]ana Street
Golden, Colorado 80401

Mr. F. C. Haas
The Oil Shale Corporation
18200 West Highway 72
Golden, Colorado 80401

June 6, 1975
HRI Project No. 535
HRI Series No. 8123
Samples Rec'd. 4/24/75

Addition to Report dated 5/16/75

Analysis No.	Sample Designation	pCi/1 Ra^{226}	±	Precision*
8123-1	SG#9-String 2-Environmental Samp.-4/11	0.0	±	0.3
-2	SG#9-String 1-6500umhos-Environ. Samp.-4/11	0.0	±	0.4
-3	Cb1-3800umhos-Environ. Samp.-4/12-Fixed	0.1	±	0.4
-4	SG#19-2825umhos-Environ. Samp.-4/13	0.3	±	0.5
-5 ✓	SG#20-2800umhos-Environ. Samp.-4/14	0.1	±	0.5
-6 ✓	SG#21-920umhos-Environ. Samp.-4/15	0.0	±	0.3
-7	Cb4-850umhos-Environ. Samp.-4/13-Fixed	0.1	±	0.4
-8	A2-1300umhos-Environ. Samp.-4/14-Fixed	0.0	±	0.3
-9	Cb2-1600umhos-Environ. Samp.-4/14-Raw	0.0	±	0.3

By: John C. Jarvis

John C. Jarvis
Manager, Analytical Laboratory

amb

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96σ.

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P II B-175

II B-190

Water Quality - Pump Tests

II B-6 WATER QUALITY ANALYSIS AQUIFER PUMP TESTS

Three water samples were collected from the central pumped well, AT-1, during the Lower Aquifer Pumping Test. Also, water was jetted from SG-1A during the "mini pump test" and three water samples were collected for analysis. Data are summarized in Tables II B-41 and II B-42. Several additional samples were collected from AT-1 on a periodic basis for limited analysis of Fluoride and Boron only. (Table II B-40.)

TABLE II B-40

FLUORIDE & BORON IN LOWER ZONE

AT-1 PUMPING TEST WATER

Date. 1975	1-20	2-5	2-23	2-24	2-25	2-27	2-28	3-1	3-3	3-5	3-7	3-1
Fluoride (ppm)	18.0	18.1	20.0	20.1	20.4	18.4	20.4	20.16	19.0	20.0	21.2	23.2
Boron (ppm)	0.65	088	1.15	1.10	1.13	1.2	1.6	1.42	2.58	2.02	2.18	2.0

TABLE II B-41
GROUNDWATER ANALYSIS
LOWER AQUIFER PUMPING TEST AT-1

Well Number: AT-1
Location: SW¼ Sec. 7 T3S R96W
Depth: see footnotes
Elevation: 6909 G.L.

	DATE ON WHICH SAMPLE TAKEN				
ELEMENT MEASURED--UNITS(mg/1) UNLESS NOTED	a	b	c		
1. Aluminum					
2. Ammonia (Nitrogen)					
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	711	734	755		
7. Bismuth					
8. Boron	3	3	3		
9. Cadmium					
10. Calcium	4.2	3.8	3.8		
11. Carbonate	24	16	11		
12. Cerium					
13. Chloride	5	5	5		
14. Chrome, Hexavalent					
15. Cobalt					
16. Conductivity, Specific (µ℧/cc)	1120	1110	1110		
17. Copper					
18. Fluoride	19	19	19		
19. Gallium					
20. Hardness (mg/1 $CaCO_3$)	24	22	24		
21. Hydroxide					
22. Iron	0.6	<.05	<.05		
23. Lead					
24. Lithium	.05	.05	.04		
25. Magnesium	2.7	2.6	2.7		
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate			.6		
31. pH	9.0	8.8	8.6		
32. Phosphate, Total	<.1	3	<.1		
33. Potassium	1	.9	.9		
34. Selenium					
35. Silica	13	13	13		
36. Sodium	320	310	310		
37. Solids, Dissolved	752	747	750		
38. Strontium					
39. Sulfate	12	8	12		
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/1 then measure					
Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

a. jet test sample at 1700 ft. 1-28-75
b. 3.5 hours of pumping at 1700 ft. 2-5-75
c. 21 hours of pumping after restart 1700 ft. 2-16-75

TABLE II B-42
GROUNDWATER ANALYSIS
WATER FROM DRILLSTEM TESTS

Well Number: SG-1A
Location: SE¼ Sec. 2, T3S R97W

Depth: See Footnotes
Elevation: 6426

SAMPLES

ELEMENT MEASURED--UNITS(mg/l) UNLESS NOTED	a	b	c		
1. Aluminum					
2. Ammonia (Nitrogen)					
3. Arsenic					
4. Barium					
5. Beryllium					
6. Bicarbonate	1632	1127	1418		
7. Bismuth					
8. Boron	11	4	11		
9. Cadmium					
10. Calcium	5.2	4.8	6		
11. Carbonate	58	23	32		
12. Cerium					
13. Chloride	172	5	69		
14. Chrome, Hexavalent					
15. Cobalt					
16. Conductivity, Specific (μ℧/cc)	2750	1580	2200		
17. Copper					
18. Fluoride	19	20	17		
19. Gallium					
20. Hardness (mg/l $CaCO_3$)	40	32	38		
21. Hydroxide					
22. Iron	<.05	<.05	<.05		
23. Lead					
24. Lithium	.5	.1	.01		
25. Magnesium	5.5	3.4	5.2		
26. Manganese					
27. Mercury					
28. Molybdenum					
29. Nickel					
30. Nitrate	1.3	.9	.3		
31. pH	8.9	8.7	8.8		
32. Phosphate, Total					
33. Potassium	.3	1.3	2.4		
34. Selenium					
35. Silica	10	17	10		
36. Sodium	816	460	640		
37. Solids, Dissolved	1905	1103	1506		
38. Strontium					
39. Sulfate	8	12	19		
40. Titanium					
41. Vanadium					
42. Yttrium					
43. Zinc					
44. Zirconium					
45. Radioactivity					
Gross Alpha (pcl)					
Radium 226*					
Gross Beta (pcl)					
Thorium 230**					
Uranium **					
46. Total Organic Carbon (TOC) If TOC >10 mg/l then measure Dissolved Organic Carbon					
Suspended Organic Carbon					
Phenols					
Sulfate, Acid Extraction					
Nitrogen, Base Extraction					
Polycyclic Aromatics					

* Required if gross alpha is greater than 4 picocuries per liter (pcl).
** Required if gross beta is greater than 100 picocuries per liter (pcl).

a. DST 4 (909-938 feet)
b. DST 8 (1125-1180 feet)
c. DST 10 (968-1010 feet)

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-57

FROM: F. C. Haas

TO: File

DATE: March 27, 1975

FILE NO.: 5100-3

SUBJECT: Analyses of Water Samples from C-b Tract, SG-AT-1

Project No. 197

Three water samples were taken from core hole SG-AT-1 while running a pump test. Samples were taken at 1700 feet, 3.5 hours after pumping, and 21 hours after pumping. Major constituent analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Results are attached.

Industrial Laboratories, reports only about 5 mg/l fluoride on all three sample, whereas, TOSCO found 19 mg/l. On two of the samples, Industrial reports no sulfate, whereas, TOSCO found 12 and 8 mg/l.

FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
B. L. Schulman
H. M. Spence
T. H. Cleveland
A. W. Schillinger
M. W. Legatski (ARCO)
D. B. Tait (ARCO)
J. R. Matis (ARCO)

Table 1

MAJOR CONSTITUENT ANALYSES, SG-AT-1

Component, mg/l	1700 Feet		3.5 Hours Pumping		21 Hours Pumping	
	Industrial	TOSCO	Industrial	TOSCO	Industrial	TOSCO
Sodium	300	320	320	316	350	310
Potassium	NA	1.0	NA	0.9	NA	0.9
Calcium	4.9	4.2	5.3	3.8	7.0	3.8
Magnesium	2.9	2.7	2.1	2.6	1.6	2.7
Sulfate	<4	12	<4	8	14	12
Carbonate	84	24	<0.1	16	<0.1	11
Bicarbonate	610	711	850	734	855	755
Chloride	14	5	<1	5	14	5
Fluoride	4.7	19	4.3	19	4.8	19
Lithium	NA	0.05	NA	0.05	NA	0.04
Borate	NA	3	NA	3	NA	3
Σ Cations, meq/l	13.53	14.38	14.35	14.17	15.70	13.94
Σ Anions, meq/l	13.44	13.92	14.16	13.94	14.96	14.19
% Difference	0.3	1.6	0.7	0.8	2.4	0.9
Silica, mg/l	15	13	14	13	14	13
pH	8.9	9.0	8.1	8.8	7.8	8.6
Calculated TDS, mg/l	725	752	762	747	824	750
Conductivity, μmhos/cm	NA	1120	NA	1110	NA	1110

NA - Not Analyzed.

Table 1

MAJOR CONSTITUENT ANALYSES, SG-AT-1

Component, mg/l	1700 Feet		3.5 Hours Pumping		21 Hours Pumping	
	Industrial	TOSCO	Industrial	TOSCO	Industrial	TOSCO
Sodium	300	320	320	316	350	310
Potassium	NA	1.0	NA	0.9	NA	0.9
Calcium	4.9	4.2	5.3	3.8	7.0	3.8
Magnesium	2.9	2.7	2.1	2.6	1.6	2.7
Sulfate	<4	12	<4	8	14	12
Carbonate	84	24	<0.1	16	<0.1	11
Bicarbonate	610	711	850	734	855	755
Chloride	14	5	<1	5	14	5
Fluoride	4.7	19	4.3	19	4.8	19
Lithium	NA	0.05	NA	0.05	NA	0.04
Borate	NA	3	NA	3	NA	3
Σ Cations, meq/l	13.53	14.38	14.35	14.17	15.70	13.94
Σ Anions, meq/l	13.44	13.92	14.16	13.94	14.96	14.19
% Difference	0.3	1.6	0.7	0.8	2.4	0.9
Silica, mg/l	15	13	14	13	14	13
pH	8.9	9.0	8.1	8.8	7.8	8.6
Calculated TDS, mg/l	725	752	762	747	824	750
Conductivity, µmhos/cm	NA	1120	NA	1110	NA	1110

NA - Not Analyzed.

dup

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7358

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SAMPLE MARKED: SG AT-1 1700 feet 1/28/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	4.9	0.245
Magnesium	2.9	0.239
Sodium	300	13.050
Carbonate	84	2.797
Bicarbonate	610	9.998
Chloride	14	0.395
Sulfate	Less than 4.0	---
Nitrate	0.4	---
Phosphate	Less than 0.1	---
Silicon dioxide	15	0.500
Iron	0.6	---
Fluoride	4.7	0.247
P. alkalinity, in terms of calcium carbonate	69	
MO alkalinity, in terms of calcium carbonate	500	
Hardness, in terms of calcium carbonate	24	
Total dissolved solids (calculated)	725	

pH 8.9

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THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Ochs
CHEMIST

THE INDUSTRIAL LABORATORIES COMPANY

Analytical and Consulting Chemists

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7359

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SAMPLE MARKED: AT-1 2/5/75 3.5 Hours after pumping started

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	5.3	0.264
Magnesium	2.1	0.173
Sodium	320	13.920
Carbonate	Less than 0.1	---
Bicarbonate	850	13.932
Chloride	Less than 1.0	---
Sulfate	Less than 4.0	---
Nitrate	0.5	---
Phosphate	3.0	---
Silicon dioxide	14	0.466
Iron	Less than 0.05	---
Fluoride	4.3	0.266
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	700	
Hardness, in terms of calcium carbonate	22	
Total dissolved solids (calculated)	770	

pH 8.1

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Analytical and Consulting Chemists

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TELEPHONE 455-3641

ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis
2 Park Central, Suite 555
1515 Arapahoe Street
Denver, Colorado 80202

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7362

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SAMPLE MARKED: AT #1 - 2/16/75 at 21 hours pumping

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	7.0	0.349
Magnesium	1.6	0.132
Sodium	350	15.225
Carbonate	Less than 0.1	---
Bicarbonate	855	14.013
Chloride	14	0.395
Sulfate	17	0.354
Nitrate	0.6	---
Phosphate	Less than 0.1	---
Silicon dioxide	14	0.466
Iron	Less than 0.05	---
Fluoride	4.8	0.252
P. alkalinity, in terms of calcium carbonate	Less than 0.1	
MO alkalinity, in terms of calcium carbonate	700	
Hardness, in terms of calcium carbonate	24	
Total dissolved solids (calculated)	810	

pH 7.8

CORRECTED COPY

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II B-200

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JOHN C. KEPHART & CO.
GRAND JUNCTION LABORATORIES
435 NORTH AVENUE ◆ PHONE 242-7618 ◆ GRAND JUNCTION, COLORADO 81501

ANALYTICAL REPORT

RECEIVED
FEB 14 1975
A. J. ROGERS

Received from: Atlantic Richfield Co.

Customer No. **Laboratory No.** 1844 **Sample**

Date Received Feb. 2,1975 **Date Reported** Feb. 3,1975

Sample	ARCO ETA(W?) SG # AT-1 Depth 1700' 1/20/75
Flouride(F)	18.0 ppm
Boron(B)	0.65 "

By

II B-201

JOHN C. KEPHART & CO.
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cc: JRM
cc: QR #2 (Becky)
LRK

RECEIVED
FEB 14 1975
A. J. ROGERS

ANALYTICAL REPORT

Received from: Atlantic Richfield Co.
Rio Blanco, Colo. Attn: Roy Damron

Customer No.
Laboratory No. 1873
Sample WATE R

Date Received 2/6/75
Date Reported 2/7/75

AT-1
2/5/75

Fluoride(F) - 18.1 p.p.m.

Boron(B) - 0.88 p.p.m.

By John C. Kephart

JOHN C. KEPHART & CO.
GRAND JUNCTION LABORATORIES
435 NORTH AVENUE ◆ PHONE 242-7618 ◆ GRAND JUNCTION, COLORADO 81501

ANALYTICAL REPORT

Received from: [illegible]
Rio Blanco, Colo.

Customer No. ______ **Laboratory No.** 1[illegible] **Sample** ______

Date Received Feb. 26, 1975 **Date Reported** March 3, 1975

Sample	2-23-75 AT1	2-24-75 AT 1	2-25-75 AT 1
Fluoride(F)	20.0 ppm	20.1 ppm	20.4 ppm
Boron(B)	1.15 "	1.10 "	1.13 "

By ______

JOHN C. KEPHART & CO.
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ANALYTICAL REPORT

Received from: [illegible]
Rio-Blanco Colo.

Customer No.

Laboratory No. [illegible]-13

Sample

Date Received [illegible]

Date Reported March 3, 1975

Sample	AT-1 2/27/75	AT-1 2/28/75	AT-1 3/1/75
[illegible]	1[illegible].4 ppm	20.4 ppm	20.16 ppm
Boron(B)	1.2 "	1.6 "	1.42 "

By

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QP #3

ANALYTICAL REPORT

Received from: [illegible]
Rio Blanco Colo.

Customer No.

Laboratory No. 2033-4

Sample [illegible]

Date Received March [illegible], 1975

Date Reported March [illegible], 1975

Well:	AT-[illegible] 3/3/75	AT-1 3/3/75
Fluoride(2)	0.72 ppm	19.0 ppm
Boron(3)	0.63 ppm	2.58 ppm

By

JRm / File

JOHN C. KEPHART & CO.

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APR 01 1975

A. J. [illegible]

ANALYTICAL REPORT

Cc: Eric Hoffman
✓ Ross

Received from: ARCO
Rio Blanco Colo.

Customer No. ______ **Laboratory No.** 2119-21 **Sample** ______

Date Received March 20,1975 **Date Reported** March 24,1975

Sample	AT-1 Lower Aquifer 3/5/75	AT-1 Lower Aquifer 3/7/75	AT-1 3/19/75
Flouride(F)	20.0 ppm	21.2 ppm	23.2 ppm
Boron(B)	2.02 ppm	2.18 ppm	2.00 ppm

By ______

LOS ANGELES ☐
DENVER ☐
GOLDEN ☒
NEW YORK ☐

THE OIL SHALE CORPORATION

INTER OFFICE MEMORANDUM

LABORATORY DATA LETTER 75-63

FROM: F. C. Haas
TO: File

DATE: April 1, 1975
FILE NO.: 5100-3
SUBJECT: Analyses of Water Samples from C-b Tract, SG-1A

Project No. 197

Three water samples from drill stem tests on SG-1A were analyzed for major constituents. Analyses were done by Industrial Laboratories, Denver, Colorado, and TOSCO, Rocky Flats. Samples were described as DST No. 4 (909-938 feet), DST No. 8 (1125-1180 feet) and DST No. 10 (968-1010 feet). Results of the analyses are given in Table 1. Industrial Laboratories, did not find any sulfate, whereas, TOSCO found from 8 to 19 mg/l. Industrial Laboratories' fluoride values are approximately 5 mg/l, whereas, TOSCO's values are from 17-20 mg/l.

FCH/aw
Encs.

Approved (MTA)

cc: R. G. Vawter
B. L. Schulman
H. M. Spence
T. H. Cleveland
A. W. Schillinger
M. W. Legatski (ARCO)
D. B. Tait (ARCO)
J. R. Matis (ARCO)

Table 1

MAJOR CONSTITUENT ANALYSES, SG-1A

Component, mg/l	DST No. 4		DST No. 8		DST No. 10	
	Industrial	TOSCO	Industrial	TOSCO	Industrial	TOSCO
Sodium	725	816	470	460	620	640
Potassium	NA	0.3	NA	1.3	NA	2.4
Calcium	8.2	5.2	6.6	4.8	9.4	6
Magnesium	4.8	5.5	3.8	3.4	3.5	5.2
Sulfate	<4	8	<4	12	<4	19
Carbonate	72	58	48	23	48	32
Bicarbonate	1540	1632	1150	1127	1460	1418
Chloride	190	172	17	5	73	69
Fluoride	4.3	19	4.7	20	4.8	17
Lithium	NA	0.5	NA	0.1	NA	0.01
Borate	NA	11	NA	4	NA	11
Σ Cations, meq/l	32.33	36.27	21.08	20.57	27.71	28.62
Σ Anions, meq/l	33.22	34.96	21.18	20.78	27.84	27.80
% Difference	1.4	1.7	0.2	0.5	0.2	1.5
Silica, mg/l	10	10	16	17	10	10
pH	8.6	8.9	8.6	8.7	8.4	8.8
Calculated TDS, mg/l	1770	1905	1130	1103	1484	1506
Conductivity, μmhos/cm	NA	2750	NA	1580	NA	2200

NA - Not Analyzed.

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7357

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SAMPLE MARKED: SG #1A - DST 4 909-938 feet 1/24/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	8.2	0.409
Magnesium	4.8	0.395
Sodium	725	31.538
Carbonate	72	2.398
Bicarbonate	1,540	25.241
Chloride	190	5.360
Sulfate	Less than 4.0	---
Nitrate	1.3	---
Phosphate	Less than 0.1	---
Silicon dioxide	10	0.333
Iron	Less than 0.05	---
Fluoride	4.3	0.226
P. alkalinity, in terms of calcium carbonate	59	
MO alkalinity, in terms of calcium carbonate	1,260	
Hardness, in terms of calcium carbonate	40	
Total dissolved solids (calciulated)	1,770	

pH 8.6

THE INDUSTRIAL LABORATORIES COMPANY
H. Paul Ochs
CHEMIST

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7360

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SAMPLE MARKED: SG-1A DST #10 968-1010 feet 2/6/75

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	9.4	0.469
Magnesium	3.5	0.288
Sodium	620	26.970
Carbonate	48	1.598
Bicarbonate	1,460	23.929
Chloride	73	2.059
Sulfate	Less than 4.0	---
Nitrate	0.3	---
Phosphate	Less than 0.1	---
Silicon dioxide	10	0.333
Iron	Less than 0.05	---
Fluoride	4.8	0.252
P. alkalinity, in terms of calcium carbonate	39	
MO alkalinity, in terms of calcium carbonate	1,200	
Hardness, in terms of calcium carbonate	38	
Total dissolved solids (calculated)	1,480	

pH 8.4

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II B-210

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ANALYSIS REPORT

ATLANTIC RICHFIELD COMPANY
John Matis

DATE RECEIVED: 2/26/75
DATE REPORTED: 3/5/75

LAB. NUMBER: 7361

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SAMPLE MARKED: DST #8 SG-1A 1125-1180 feet

ANALYSIS:

	MILLIGRAMS PER LITER	MILLI-EQUIVALENTS
Calcium	6.6	0.329
Magnesium	3.8	0.313
Sodium	470	20.445
Carbonate	48	1.598
Bicarbonate	1,150	18.849
Chloride	17	0.480
Sulfate	Less than 4.0	---
Nitrate	0.9	---
Phosphate	Less than 0.1	---
Silicon dioxide	16	0.533
Iron	Less than 0.05	---
Fluoride	4.7	0.247
P. alkalinity, in terms of calcium carbonate	39	
MO alkalinity, in terms of calcium carbonate	940	
Hardness, in terms of calcium carbonate	32	
Total dissolved solids (calculated)	1,130	

pH 8.6

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Aquifer Data - Jetting Tests

II B-7 AQUIFER DATA JETTING TESTS

Since most of the drilling on Tract C-b has already been completed and reported in Quarterly Report #1 and Quarterly Report #2, there are no jetting test aquifer data to report in this section. Small quantities of water (generally less than 10 gpm) were jetted from SG-1a in association with the drillstem tests run on it. All of the SG-1a jetting test data will be found in the section on drillstem tests and multi-packer tests in this report Section II B-8.

Aquifer Data - Drillstem and Multipacker Tests

II B-8 AQUIFER DATA

DRILL-STEM TESTS, MULTIPACKER TESTS & MINI-PUMP TEST

DRILL STEM TESTS

Data filed in this report include drill-stem test data from SG-17, SG-20, and SG-21. (See Tables II B-46, II B-47, and II B-48 and following subsections. These data, not reproduced in time for previous submittal, are an addition to pressure response data which were included in Quarterly Report #2. Those parties interested in the development and significance of the drillstem-test program are referred to Quarterly Report #2, Volume II, page II B-252 ff.

In late December, 1974 drill-stem tests were run on Coreholes SG-1 and SG-8. These were reported in Quarterly Report #2, Page II B-45. In addition, laboratory analyses of water collected during the tests were included and can be found in the water quality summary tables, pages II B-48 and II B-52, Quarterly Report #2. Technical reports for these two drill-stem tests were inadvertently omitted from Quarterly Report #2 but are included herein to complete the data presentation.

For the purposes of analyzing vertical permeability on the C-b Tract, additional drill-stem tests were made on SG-1 and SG-1a in association with what has been termed a "mini-pump test". (See Tables II B-43, II B-44, and II B-45.) The data on these tests are reported in this subsection.

A writeup and description of the mini-pump test and tables which define the packer settings are on the following pages. (Raw data sheets from Sperry Sun and Johnston are also included in this subsection.)

TWIN HOLE TEST PROGRAM AT SG-1a

During January and early February of 1975 a series of drill-stem jetting tests were conducted on Tract C-b at Corehole SG-1. The tests were designed to evaluate the vertical permeability of potential aquitards above the Mahogany mining zone. The term "aquitard" refers to layers of rock or sediment which have a low permeability and which retard or prevent movement of water across them. (Several rich, unfractured oil shale bands were identified in the core from SG-1 which appeared to be impermeable zones above the Mahogany.)

Validation of the aquitard hypothesis was considered extremely important. Mining engineers generally wish to limit the amount of water entering an underground mine as much as possible. If aquitards potentially exist underground, it would be important to know of their existence and take steps in mining activities to preserve their water retarding capabilities.

A hole, SG-1a, was drilled approximately 100 feet from SG-1 down to the uppermost potential aquitard. (See Figure II B-1, Page II B-6 for location of test site). Pressure bombs were installed in both wells, and in the zones isolated by packers. They were set to monitor water levels within and above potential aquitards. Water was jetted from SG-1a for a period of 24 hours from each isolated zone. The well was then deepened and the test rerun through a succession of 10 intervals. Relatively small amounts of water were produced because of the small thickness of the packed off intervals.

Data from pressure bombs above and below the packers gave information on packer success or failure, and also on vertical permeability. Computer modeling of the test situation indicated that the barriers have permeabilities less than .1 millidarcy in the vicinity of SG-1 and SG-1a.

A report prepared by the C-b Lessees using reservoir simulation techniques discusses the twin hole test in the following subsection.

Mini-Pump Testing Program

A. Initial Theoretical Evaluation

A mini-pump test program using Wells SG-1 and SG-1a was suggested and implemented. The initial plan was to jet Well SG-1a and measure the response in Well SG-1 above and below a barrier (See Figure II B-7). Theoretical calculations on Tract C-b were carried out to determine the relative accuracy of measuring the vertical permeability of a barrier using this approach. Distance between wells and rate of pumping were the two obvious parameters to investigate. Table II B-43 lists rock properties used for these calculations. Layer No. 6 was the barrier. SG-1a was pumped from layers 3, 4 and 5 and pressures were recorded in layer 5 at SG-1a and in layers 5 and 7 at SG-1.

Figure II B-7 Proposed Mini Pump Test Configuration

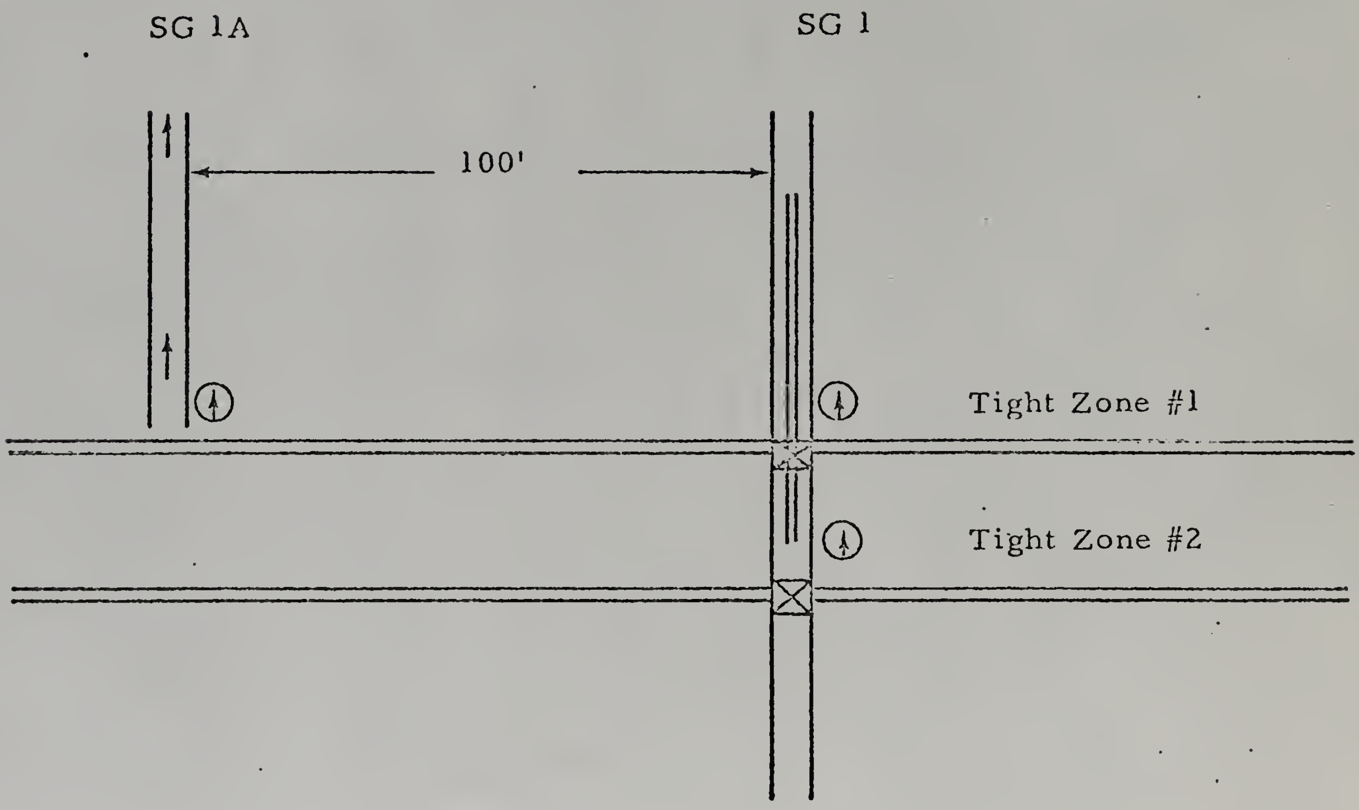

SG 1A
SG 1
100'
Tight Zone #1
Tight Zone #2

TABLE II B-43

ROCK PROPERTIES FOR THEORETICAL MINI-PUMP CALCULATIONS

	Layer No.	Permeability, md.		Porosity %	Layer Thickness, ft.
		Horizontal	Vertical		
	1	10000.0	10000.0	1000.0	2.0
	2	20.0	10.0	20.0	410.0
	3	100.0	50.0	20.0	100.0
	4	100.0	50.0	20.0	450.0
	5	100.0	50.0	20.0	10.0
Tight Zone →	6	*	*	0.1	**
	7	100.0	50.0	20.0	10.0
	8	100.0	50.0	20.0	50.0
	9	100.0	50.0	20.0	100.0
	10	100.0	50.0	20.0	450.0

* Varied from 0.01 to 5.0 md.

** Used Values of 3.0 and 5.0 feet

Figure II B-8 shows some results of this work. It can be seen that if the pumping rate were 10,000 BWPD, measureable pressure differentials could be expected across barriers whose permeabilities were as high as 1 to 2 md. Figure II B-9 shows that with a production rate of 3,000 BWPD, measureable pressure differentials would occur if the barrier permeability was less than about 0.5 md. Figure II B-10 shows extrapolations of the results of these calculations to lower production rates. It can be seen at low rates (less than 500 BWPD) that the pressure differential across the barrier for a one md vertical permeability is practically the same as before the start of the test. Vertical permeabilities from 0.1 md and lower could be detected barring severe open hole effects but could not be calculated accurately. Figure II B-11 illustrates the influence that distance between the pumping and observation wells has upon pressure response.

B. Test #10

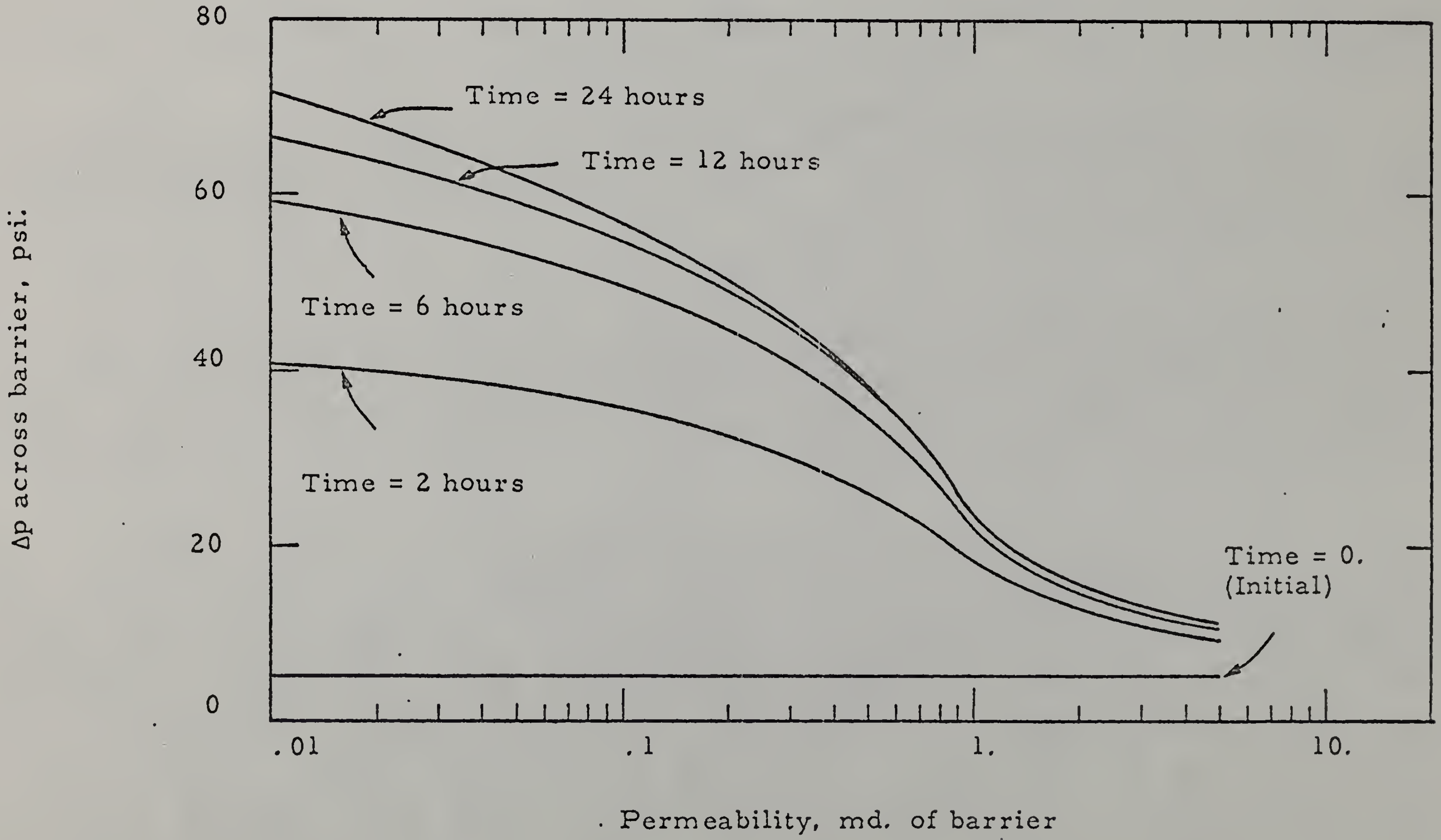
A series of tests were conducted in SG-1a. Of these, Test #10 illustrates the most significant aspects of the twin hole program. Figure II B-8 in the preceding evaluation indicated that it could be possible to measure a pressure contrast across barriers and this contrast would be amplified with lower vertical permeability values. However, Figure II B-10 indicated at lower rates the total pressure differential becomes small.

Unfortunately, the rates used in the mini-pump tests were extremely low, approximately 10 gal/min or 350 BWPD. The configuration of Test #10 is shown in Figure II B-12. Table II B-44 lists rock properties used to evaluate the performance of Test #10. Figure II B-13 shows results of that evaluation. The pressure change measured between packers in Well SG-1 was matched assuming zero vertical permeability in the barriers. Then additional runs were made assuming vertical permeabilities of .001, .01, 0.1 and 1.0 md. Layers 5 and 9 are the positions of the upper and lower gauges, respectively in SG-1. It can be seen that vertical barrier permeabilities of .001 and .01 could not be distinguished from zero because of the low response in layers 5 and 9. A vertical permeability of 0.1 could possibly be detected if hole effects did not mask out the 3 psi response. If the vertical permeabilities of these zones were as high as one md, readings of all three gauges in SG-1 would show nearly the same pressure change and appear to be a packer failure.

To obtain qualitative information of the hole effect on the response gauges in SG-1 several cases were simulated with a high vertical permeability zone above and below the packers in SG-1. The pressure drop was reduced by more than half in the cases studied.

Since the packers held well in this test (neither the upper or lower gauge values varied one psi during the drawdown), the only conclusion to make is that the vertical permeabilities of these two barriers appear to be less than 0.1 md.

Figure II B-8 Effect of Permeability on Δp Across Barrier



Thickness of barrier = 3 feet
Radial distance from well = 100 ft.
Rate = 10000 BPD
(See Table II for permeability
data of model)

Figure II B-9 Effect of Permeability on Δp Across Barrier

Thickness of barrier = 3.0 ft.
Radial distance from well = 100. ft.
Rate = 3000. BPD

(See Table II for permeability
data for this model)

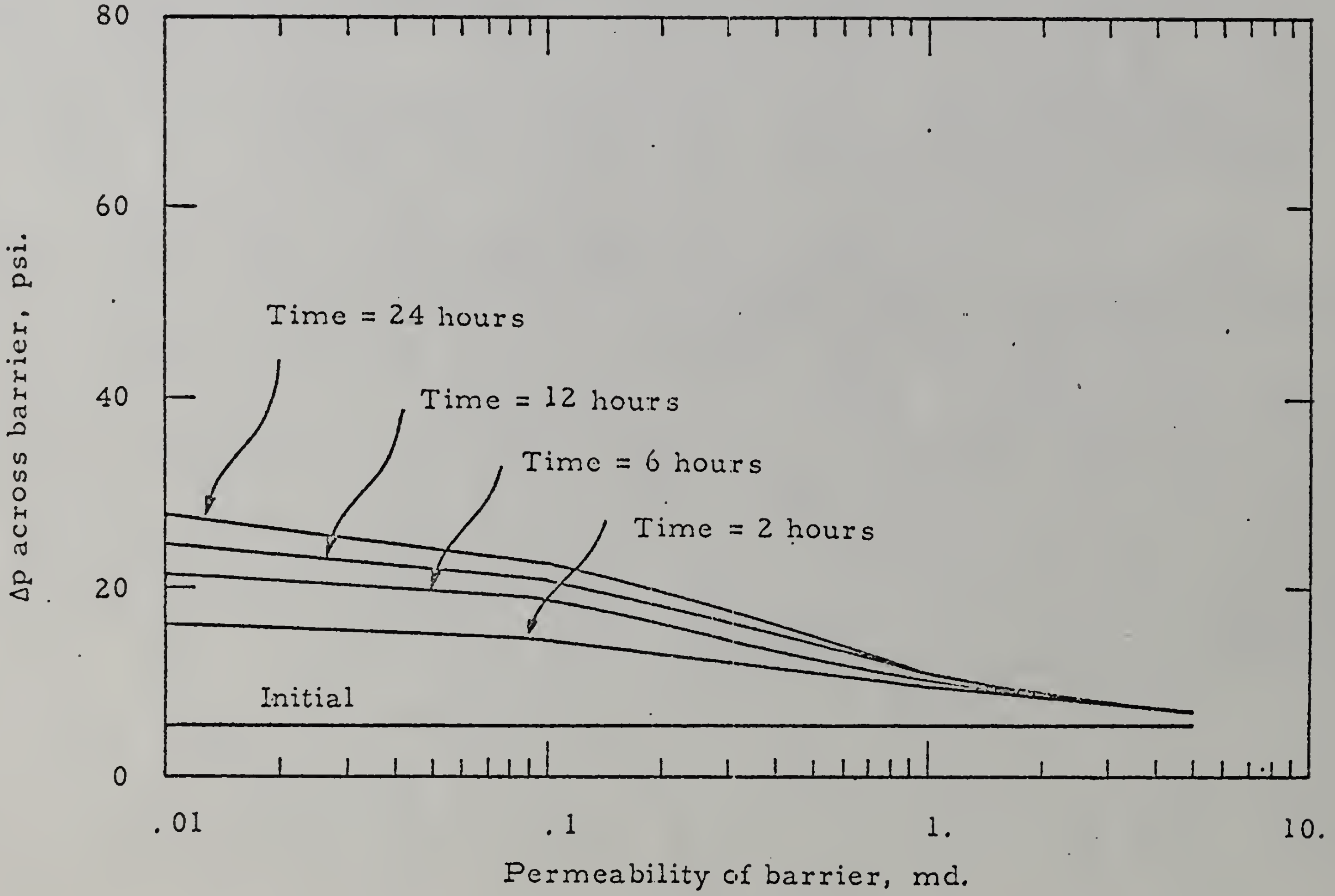


Figure II B-10 Effect of Rate on Δp Across Barrier

Thickness of barrier = 3.0 feet
Radial distance from well = 100. feet
(See Table II for permeability data)

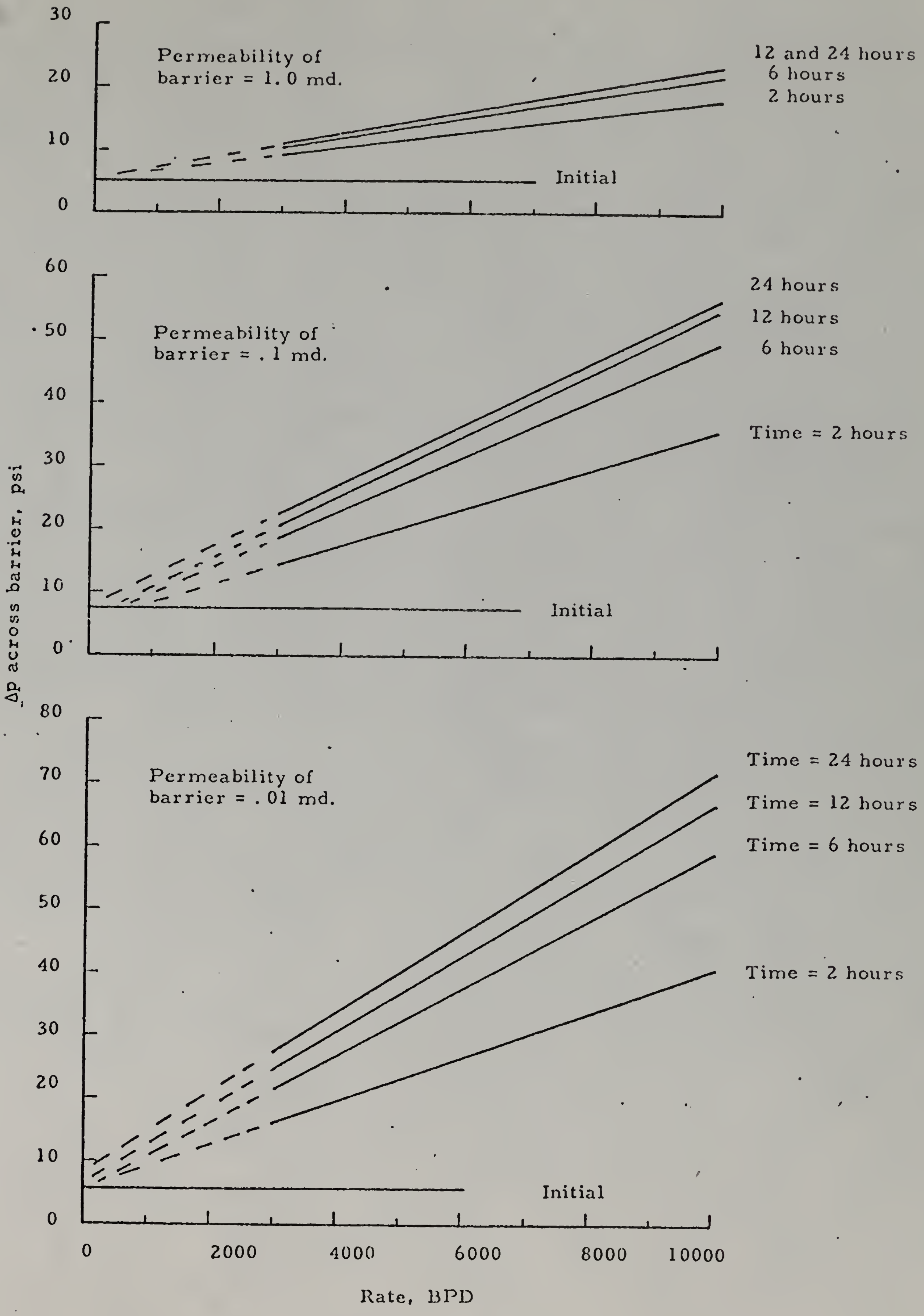


Figure II B-11 Influence of distance from Well on Δp in 24 hours

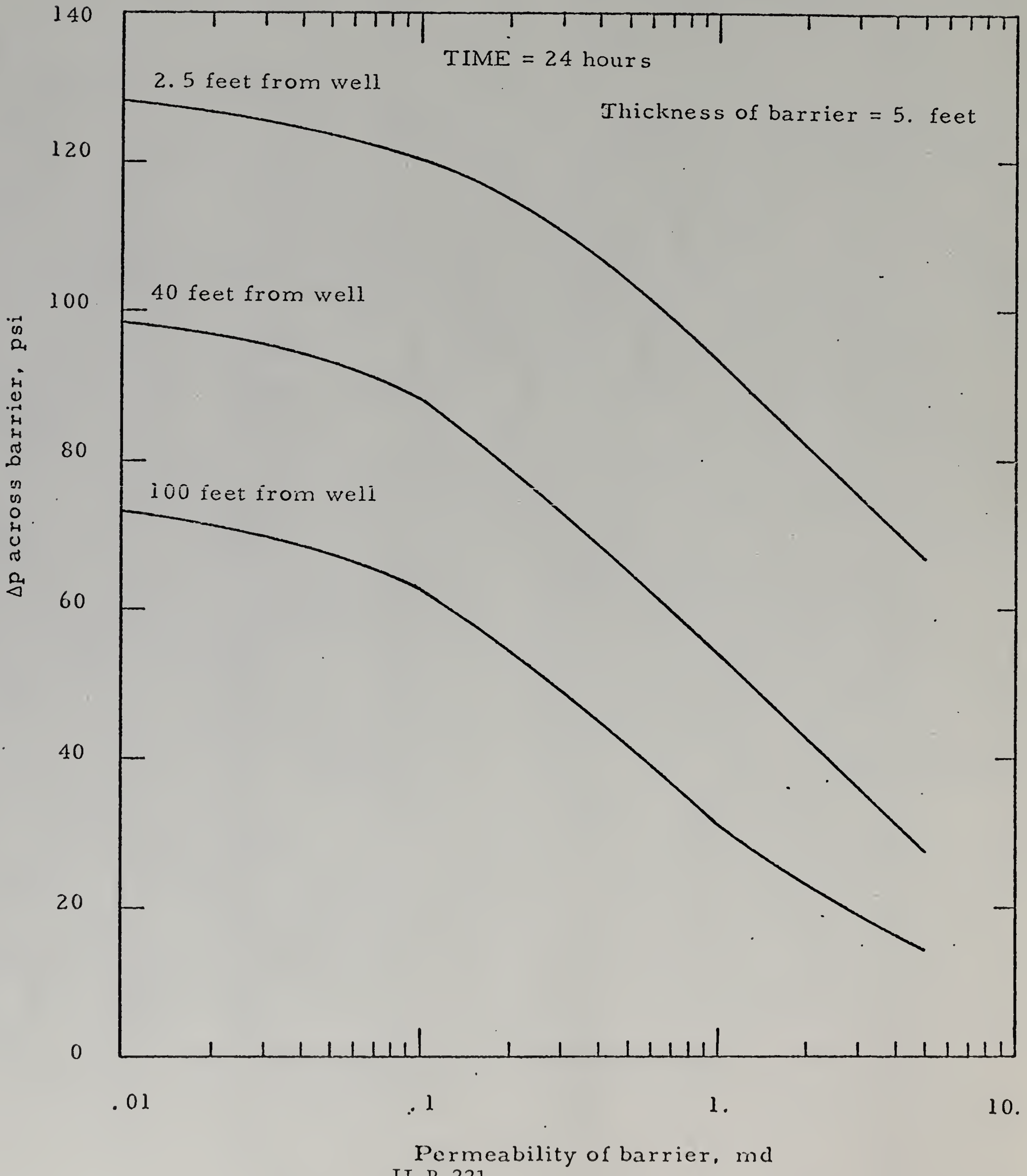
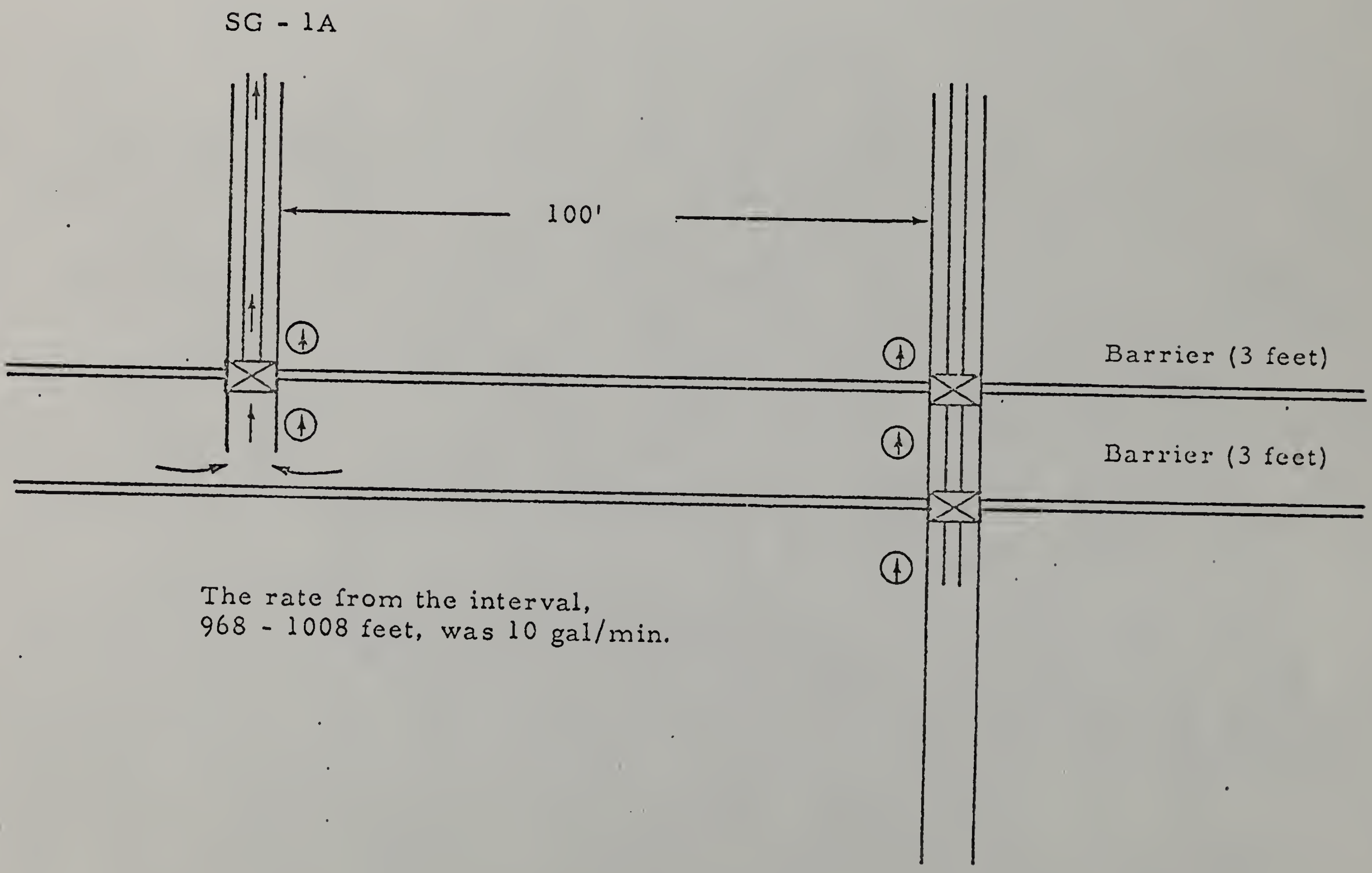


Figure II B-12 Mini Pump Test No. 10 Configuration


SG - 1A
100'
Barrier (3 feet)
Barrier (3 feet)

The rate from the interval,
968 - 1008 feet, was 10 gal/min.

Table II B-44

Permeability Date for Effect of

Vertical Permeability of Barriers

Mini - Pump Test No. 10

Layer No.	Permeability, md. Horizontal	Vertical	Porosity Fraction	Thickness Feet	Cumulative Depth, Feet
1	10000.	10000.	1000.	2.	2.
2	10.	10.	.2	410.	412.
3	11.	11.	.2	455.	867.
4	12.7	12.7	.2	53.	920.
5	34.0	34.0	.2	45.	965.
6	1.0*	1.0*	.001	3.	968.
7	150.	50.0	.2	40.	1008.
8	1.0*	1.0*	.001	3.	1011.
9	19.9	19.9	.2	14.	1025.
10	8.0	8.0	.2	345.	1370.

*varied this value from .001 to 1.0 md.

Figure II B-13Mini-Pump Test No. 10
Effect of Barrier Permeability on Δp

Pressure Effect at End of Test

No Hole Effect

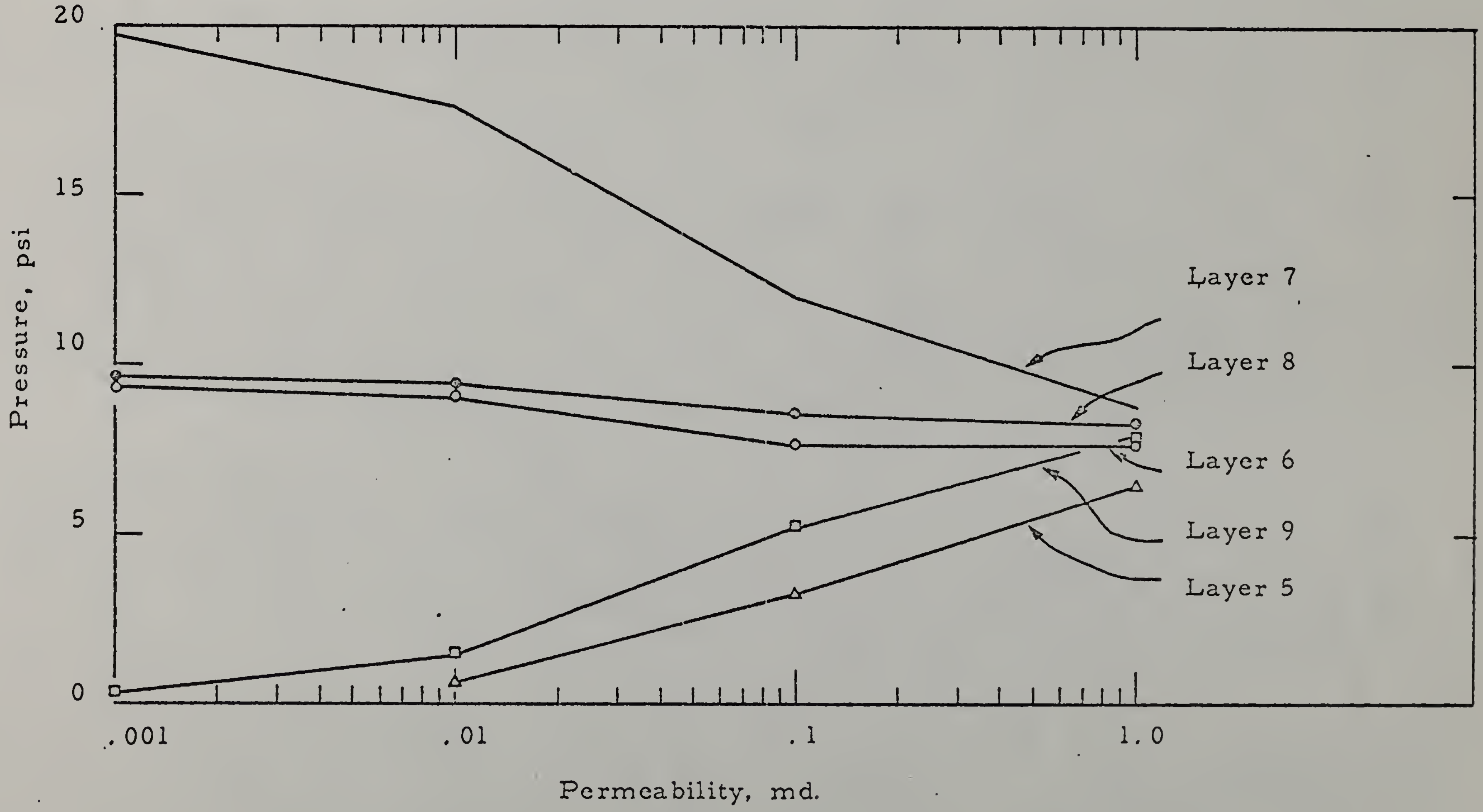


Table II B-45

SUMMARY OF MINI PUMP TESTS

BOREHOLES SG - 1/SG - 1A

Min. Test No.	Borehole SG - 1			Borehole SG - 1A			Production Zone	Comments
	Depth of Packers (Ft.) Upper	Depth of Packers (Ft.) Lower	Borehole Depth (Ft.)	Depth of Packers (Ft.) Upper	Depth of Packers (Ft.) Lower	Borehole Depth (Ft.)		
1	907	944	2525	-	-	900	Above rich Zone 1	
2	944	968	2525	-	-	938	Above rich Zone 2	
3	907	944	2525	-	-	938	Above rich Zone 2	Packer leakage repeated as Min 4
4	907	944	2525	-	909	938	Between rich Zones 1 and 2	
5	944	968	2525	-	947	969	Between rich Zones 2 and 3	Packer leakage repeated as Min 6
6	944	968	2525	-	947	969	Between rich Zones 2 and 3	
7	968	1000	2525	-	968	1001	Between rich Zones 3 and 4	
8	1123	1188	2525	-	1125	1180	Between rich Zones 5 and 6	
9	969	1001	2525	968	1002	1180	Between rich Zones 3 and 4	Packer malfunction repeated as Min 10
10	968	1008	2525	969	1009	1180	Between rich Zones 3 and 4	

NOTES

1. Jetting conducted in SG - 1A from within the production zone indicated; pressure response in the production zone, above and below it, measured in Borehole SG - 1, 100 ft. distant.

2. "Rich Zones" are located at the following depths in the boreholes:

Rich Zone	Depth (Ft.)
1	907
2	944
3	968
4	1008
5	1123
6	1180

Table II B-46
SUMMARY MULTI-PACKER TESTS
(SPERRY SUN)
BOREHOLE SG-1

(Elevation 6428 G.L., Total Depth 2525)

MINI PUMP NO	SPERRY SUN TEST NO.	PACKER DEPTH (Ft.)		DEPTH OF PRESSURE RECORDERS			LENGTH OF TEST (Hrs.)	HOURS JETTING FROM 1-A	COMMENTS
		1	2	1	2	3			
1.	1.	907	944	894	921	958	25.2	24	Less than 2 psi pressure differential recorded in the interval 944-2522 TD SG-1A 900 feet.
2.	2.	944	968	934	948	972	46.7	22.4	TD SG-1A 938 feet.
4.	3.	907	944	893	918	959	28.6	24	TD SG-1A 938 feet, packer at 90
5.	4.	944	970	932	956	990	31.3	6	TDSG-1A 969 feet, packer at 947 missrun packers leaked
6.	5.	944	970	932	956	990	17	12	TDSG-1A 969 packer at 947 feet
7.	6.	968	1002	958	993	1012	45.1	11.6	TDSG-1A 1001 packer at 968'
8.	7.	1123	1188	1117	1132	1194	42.7	24.	TDSG-1A 1180, packer at 1125 No appreciable change in pressure on recorder No.3, interval 1188-2522,during test
10.	8.	968	1008	958	978	1018	38.2	24	No appreciable change in pressure on recorders 1 and 3 during test, interval 0-968 & 1008-2522 Packers in SG-1A 968-1009

	3.	907	944	Missrun Packer leaked
	5.	944	968	Missrun Packer leaked
	9.	968	1002	Missrun Blew Packer on SG-1

Table II B-47

SUMMARY DRILLSTEM TEST INTERVALS
(JOHNSTON TESTERS)
BOREHOLE SG-1

(Elevation 6428 G.L., Total Depth 2525)

JOHNSTON DST NO.	PACKER DEPTH (Ft.) UPPER	LOWER	DEPTH OF PRESSURE RECORDERS 1	2	3	LENGTH OF TEST (Hrs.)	LENGTH JETTING FROM 1-A (Hrs.)	COMMENTS - ZONE TESTED
1.	907	944	898	937	964	25	24	No Measurable Variation in Pressures on Recorder No. 3 Zone 944-TD
2.	944	968	934	958	985	48	23	No Measurable Variation in Pressure on Recorder No. 3 Zone 968-TD
3.	907	944	898	933	954	–	–	Unsuccessful test, packer seat failure

Job No. SP-1123 Date 1/17/75 Run 1 Office CASPER

Customer [illegible] Location [illegible] Gulch

State Colorado County/~~Parish~~ Rio BLANCO

Well SG- No. 1 Field TRACT Cb

USE MILITARY TIME FOR ALL TIMES

	Time	Date	Time	Date	Time Charged
Arrive: Well/~~Truck~~	1. 1600	1/17/75	2. 2100	1/18/75	
Depart: Well/~~Truck~~	1. 20.00	1/17/75	2. 0300	1/19/75	Hrs.
Gauge Start in Hole	1. 1645	1/17/75	2.		
Gauge Out of Hole	1. 1334	1/18/75	2.		Hrs.

No. Trips 2 Miles 45 Total Mileage 180

Top Gauge # 64 Element # 35760 Range 1200# Time Mode 2 MIN
MID. GAUGE # 193 ELEMENT 35789 RANGE 1400# TIME MODE 2 MIN
Btm. Gauge # 222 Element # 35930 Range 1400# Time Mode 2 MIN

Type Tool Johnston Hyd. Test Depth 907-944' Zero Point GROUND LEVEL

Packer Depth 907-944 Tail Pipe Depth 969.50 OUTSIDE Top Gauge Depth 894'
MID. GAUGE 911'

Bottom Hole Temp. ____ Atmos. Temp. 32°F Bottom Gauge Depth 958'

TIME INFORMATION	Time	Date	PRESSURE INFORMATION	
On Bottom			Initial Hydrostatic Mud	
Packer Set			Initial Draw Down	
Initial Open			Initial Build-Up	
Initial Shut-In			Final Flow	
Start Flow			Final Build-Up	
Final Shut-In			Final Hydrostatic Mud	
Packer Unseated			Mud Weight	

TIME OF SURFACE SULLS

MID. GAUGE 1709 1711 1713

Top Gauge 1736 1738 1740 Bottom Gauge 1624 1626 1628

Remarks MULTI-PACKER TEST - INJECTION SG-1A 100' DISTANT.

BILL FOSTER
Operator

SP-423

SG-1 Multipacker Tests Pressure Survey Reports (Sperry Sun)

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PRECISION SUBSURFACE PRESSURE GAUGE REPORT

PREPARED FOR

ATLANTIC RICHFIELD COMPANY

WELL NUMBER	FEDERAL SG-1
FIELD/LEASE	SORGHUM GULCH TRACT CB
COUNTY/PARISH	RIO BLANCO
STATE	COLORADO
TYPE OF TEST	MULTI-PACKER DRILL STEM (PULSE)
REFERENCE ELEV	GROUND LEVEL

ADDITIONAL INFORMATION

GAUGE NO. 64 RAN WITH 1200 LBS. ELEMENT IN ANNULUS

GAUGE DEPTH WAS AT 894 FT. AND TOP PACKER AT 907 FT.

GROUND LEVEL IS 6426 FT. APPROX.

INITIAL HYDROSTATIC PRESSURE 344.44 PSI

FINAL HYDROSTATIC PRESSURE 342.98 PSI.

THE TEST INTERVAL WAS FROM SURFACE TO 894 FT.

JETTING WAS DONE ON SG-1A WHICH IS 100 FT. (SURFACE)

AWAY FROM SG-1.

753 POINTS REPORTED THIS JOB

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DELTA TIME	PRESSURE (PSI)	TIME HR	TIME MIN	DATE	COMMENTS
0.000	353.138	20	50	JAN 17,1975	ON BOTTOM
.033	353.138	20	52	JAN 17,1975	
.067	353.138	20	54	JAN 17,1975	
.100	353.192	20	56	JAN 17,1975	
.134	353.138	20	58	JAN 17,1975	
.167	353.219	21	00	JAN 17,1975	START JETTING
.201	353.435	21	02	JAN 17,1975	IN SG 1A
.234	351.410	21	04	JAN 17,1975	
.268	350.222	21	06	JAN 17,1975	
.301	349.331	21	08	JAN 17,1975	
.335	348.710	21	10	JAN 17,1975	
.368	348.197	21	12	JAN 17,1975	
.402	347.738	21	14	JAN 17,1975	
.435	347.307	21	16	JAN 17,1975	
.469	346.929	21	18	JAN 17,1975	
.502	346.578	21	20	JAN 17,1975	
.535	346.335	21	22	JAN 17,1975	
.569	346.065	21	24	JAN 17,1975	
.602	345.768	21	26	JAN 17,1975	
.636	345.552	21	28	JAN 17,1975	
.669	345.363	21	30	JAN 17,1975	
.703	345.066	21	32	JAN 17,1975	
.736	344.931	21	34	JAN 17,1975	
.770	344.742	21	36	JAN 17,1975	
.803	344.607	21	38	JAN 17,1975	
.837	344.364	21	40	JAN 17,1975	
.870	344.202	21	42	JAN 17,1975	
.904	344.040	21	44	JAN 17,1975	
.937	343.905	21	46	JAN 17,1975	
.971	343.716	21	48	JAN 17,1975	
1.004	343.527	21	50	JAN 17,1975	
1.037	343.419	21	52	JAN 17,1975	
1.071	343.284	21	54	JAN 17,1975	
1.104	343.095	21	56	JAN 17,1975	
1.138	342.933	21	58	JAN 17,1975	
1.171	342.852	22	00	JAN 17,1975	
1.205	342.717	22	02	JAN 17,1975	
1.238	342.555	22	04	JAN 17,1975	
1.272	342.447	22	06	JAN 17,1975	
1.305	342.339	22	08	JAN 17,1975	

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1.339	342,231	22	10	JAN 17,1975	
1.372	342,096	22	12	JAN 17,1975	
1,406	341,961	22	14	JAN 17,1975	
1,439	341,880	22	16	JAN 17,1975	
1,473	341,799	22	18	JAN 17,1975	
1.506	341,718	22	20	JAN 17,1975	
1.539	341.610	22	22	JAN 17,1975	
1,573	341.502	22	24	JAN 17,1975	
1.606	341,421	22	26	JAN 17,1975	
1,640	341.286	22	28	JAN 17,1975	
1,673	341.178	22	30	JAN 17,1975	
1,707	341,097	22	32	JAN 17,1975	
1,740	341.016	22	34	JAN 17,1975	
1,774	340.935	22	36	JAN 17,1975	
1.807	340.881	22	38	JAN 17,1975	
1,841	340.827	22	40	JAN 17,1975	
1,874	340,719	22	42	JAN 17,1975	
1,908	340,665	22	44	JAN 17,1975	
1.941	340.557	22	46	JAN 17,1975	
1.974	340,503	22	48	JAN 17,1975	
2,008	340,395	22	50	JAN 17,1975	
2,041	340.368	22	52	JAN 17,1975	
2,075	340,260	22	54	JAN 17,1975	
2,108	340,179	22	57	JAN 17,1975	
2,142	340,152	22	59	JAN 17,1975	
2,175	340.044	23	01	JAN 17,1975	
2,209	340.017	23	03	JAN 17,1975	
2.242	339.963	23	05	JAN 17,1975	
2,276	339.855	23	07	JAN 17,1975	
2,309	339.828	23	09	JAN 17,1975	
2,343	339,747	23	11	JAN 17,1975	
2,376	339,666	23	13	JAN 17,1975	
2,410	339,666	23	15	JAN 17,1975	
2,443	339.558	23	17	JAN 17,1975	
2,476	339,531	23	19	JAN 17,1975	
2,510	339,504	23	21	JAN 17,1975	
2,543	339.396	23	23	JAN 17,1975	
2,577	339,396	23	25	JAN 17,1975	
2,610	339,315	23	27	JAN 17,1975	
2,644	339,234	23	29	JAN 17,1975	

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2,677	339.207	23	31	JAN 17,1975	
2,711	339.180	23	33	JAN 17,1975	
2,744	339.126	23	35	JAN 17,1975	
2,778	339.072	23	37	JAN 17,1975	
2,811	339.045	23	39	JAN 17,1975	
2,845	339.018	23	41	JAN 17,1975	
2,878	338.991	23	43	JAN 17,1975	
2,912	338.829	23	45	JAN 17,1975	
2,945	338.883	23	47	JAN 17,1975	
2,978	338.802	23	49	JAN 17,1975	
3,012	338.802	23	51	JAN 17,1975	
3,045	338.694	23	53	JAN 17,1975	
3,079	338.640	23	55	JAN 17,1975	
3,112	338.586	23	57	JAN 17,1975	
3,146	338.586	23	59	JAN 17,1975	
3,179	338.559	00	01	JAN 18,1975	
3,213	338.478	00	03	JAN 18,1975	
3,246	338.451	00	05	JAN 18,1975	
3,280	338.424	00	07	JAN 18,1975	
3,313	338.370	00	09	JAN 18,1975	
3,347	338.316	00	11	JAN 18,1975	
3,380	338.316	00	13	JAN 18,1975	
3,414	338.262	00	15	JAN 18,1975	
3,447	338.208	00	17	JAN 18,1975	
3,480	338.208	00	19	JAN 18,1975	
3,514	338.101	00	21	JAN 18,1975	
3,547	338.047	00	23	JAN 18,1975	
3,581	338.020	00	25	JAN 18,1975	
3,614	337.993	00	27	JAN 18,1975	
3,648	337.966	00	29	JAN 18,1975	
3,681	337.939	00	31	JAN 18,1975	
3,715	337.912	00	33	JAN 18,1975	
3,748	337.858	00	35	JAN 18,1975	
3,782	337.804	00	37	JAN 18,1975	
3,815	337.804	00	39	JAN 18,1975	
3,849	337.804	00	41	JAN 18,1975	
3,882	337.723	00	43	JAN 18,1975	
3,916	337.723	00	45	JAN 18,1975	
3,949	337.669	00	47	JAN 18,1975	
3,982	337.669	00	49	JAN 18,1975	

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4.016	337.588	00	51	JAN 18,1975	
4.049	337.561	00	53	JAN 18,1975	
4.083	337.561	00	55	JAN 18,1975	
4.116	337.507	00	57	JAN 18,1975	
4.150	337.453	00	59	JAN 18,1975	
4.183	337.426	01	01	JAN 18,1975	
4.217	337.372	01	03	JAN 18,1975	
4.250	337.345	01	05	JAN 18,1975	
4.284	337.318	01	07	JAN 18,1975	
4.317	337.264	01	09	JAN 18,1975	
4.351	337.264	01	11	JAN 18,1975	
4.384	337.183	01	13	JAN 18,1975	
4.418	337.183	01	15	JAN 18,1975	
4.451	337.156	01	17	JAN 18,1975	
4.484	337.102	01	19	JAN 18,1975	
4.518	337.075	01	21	JAN 18,1975	
4.551	337.129	01	23	JAN 18,1975	
4.585	337.048	01	25	JAN 18,1975	
4.618	337.048	01	27	JAN 18,1975	
4.652	336.994	01	29	JAN 18,1975	
4.685	336.967	01	31	JAN 18,1975	
4.719	336.940	01	33	JAN 18,1975	
4.752	336.886	01	35	JAN 18,1975	
4.786	336.805	01	37	JAN 18,1975	
4.819	336.859	01	39	JAN 18,1975	
4.853	336.832	01	41	JAN 18,1975	
4.886	336.778	01	43	JAN 18,1975	
4.920	336.751	01	45	JAN 18,1975	
4.953	336.724	01	47	JAN 18,1975	
4.986	336.670	01	49	JAN 18,1975	
5.020	336.697	01	51	JAN 18,1975	
5.053	336.643	01	53	JAN 18,1975	
5.087	336.643	01	55	JAN 18,1975	
5.120	336.589	01	57	JAN 18,1975	
5.154	336.535	01	59	JAN 18,1975	
5.187	336.508	02	01	JAN 18,1975	
5.221	336.508	02	03	JAN 18,1975	
5.254	336.427	02	05	JAN 18,1975	
5.288	328.382	02	07	JAN 18,1975	
5.321	336.427	02	09	JAN 18,1975	

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5,355	336,373	02	11	JAN 18,1975	
5,388	336.319	02	13	JAN 18,1975	
5,421	336,373	02	15	JAN 18,1975	
5,455	336,292	02	17	JAN 18,1975	
5,488	336,238	02	19	JAN 18,1975	
5,522	336.292	02	21	JAN 18,1975	
5,555	336,238	02	23	JAN 18,1975	
5,589	336,184	02	25	JAN 18,1975	
5,622	336,184	02	27	JAN 18,1975	
5,656	336.130	02	29	JAN 18,1975	
5,689	336,184	02	31	JAN 18,1975	
5,723	336,130	02	33	JAN 18,1975	
5,756	336,103	02	35	JAN 18,1975	
5,790	336.049	02	37	JAN 18,1975	
5.823	336.049	02	39	JAN 18,1975	
5,857	336.049	02	41	JAN 18,1975	
5,890	336,022	02	43	JAN 18,1975	
5,923	336.022	02	45	JAN 18,1975	
5,957	335,914	02	47	JAN 18,1975	
5,990	335,914	02	49	JAN 18,1975	
6,024	335,887	02	51	JAN 18,1975	
6,057	335.860	02	53	JAN 18,1975	
6,091	335.860	02	55	JAN 18,1975	
6,124	335.833	02	57	JAN 18,1975	
6.158	335,752	02	59	JAN 18,1975	
6,191	335,779	03	01	JAN 18,1975	
6,225	335.752	03	03	JAN 18,1975	
6,258	335.752	03	05	JAN 18,1975	
6,292	335,725	03	07	JAN 18,1975	
6,325	335,698	03	10	JAN 18,1975	
6,359	335,671	03	12	JAN 18,1975	
6,392	335,644	03	14	JAN 18,1975	
6,425	335,590	03	16	JAN 18,1975	
6,459	335,617	03	18	JAN 18,1975	
6,492	335,644	03	20	JAN 18,1975	
6,526	335,563	03	22	JAN 18,1975	
6,559	335,509	03	24	JAN 18,1975	
6,593	335,536	03	26	JAN 18,1975	
6,626	335,482	03	28	JAN 18,1975	
6,660	336,643	03	30	JAN 18,1975	

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DELTA TIME	PRESSURE (PSI)	TIME HR	MIN	DATE	COMMENTS
6.693	335.455	03	32	JAN 18,1975	
6.727	335.455	03	34	JAN 18,1975	
6.760	335.428	03	36	JAN 18,1975	
6.794	335.428	03	38	JAN 18,1975	
6.827	335.347	03	40	JAN 18,1975	
6.861	335.401	03	42	JAN 18,1975	
6.894	335.401	03	44	JAN 18,1975	
6.927	335.347	03	46	JAN 18,1975	
6.961	335.320	03	48	JAN 18,1975	
6.994	335.320	03	50	JAN 18,1975	
7.028	335.293	03	52	JAN 18,1975	
7.061	335.239	03	54	JAN 18,1975	
7.095	335.239	03	56	JAN 18,1975	
7.128	335.320	03	58	JAN 18,1975	
7.162	335.293	04	00	JAN 18,1975	
7.195	335.239	04	02	JAN 18,1975	
7.229	335.212	04	04	JAN 18,1975	
7.262	335.212	04	06	JAN 18,1975	
7.296	335.266	04	08	JAN 18,1975	
7.329	335.239	04	10	JAN 18,1975	
7.363	335.185	04	12	JAN 18,1975	
7.396	335.158	04	14	JAN 18,1975	
7.429	335.131	04	16	JAN 18,1975	
7.463	335.131	04	18	JAN 18,1975	
7.496	335.050	04	20	JAN 18,1975	
7.530	335.077	04	22	JAN 18,1975	
7.563	335.131	04	24	JAN 18,1975	
7.597	335.104	04	26	JAN 18,1975	
7.630	335.023	04	28	JAN 18,1975	
7.664	335.077	04	30	JAN 18,1975	
7.697	335.050	04	32	JAN 18,1975	
7.731	334.996	04	34	JAN 18,1975	
7.764	334.969	04	36	JAN 18,1975	
7.798	334.996	04	38	JAN 18,1975	
7.831	334.969	04	40	JAN 18,1975	
7.865	334.915	04	42	JAN 18,1975	
7.898	334.915	04	44	JAN 18,1975	
7.931	334.915	04	46	JAN 18,1975	
7.965	334.915	04	48	JAN 18,1975	
7.998	334.915	04	50	JAN 18,1975	

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8.032	334.861	04	52	JAN 18,1975	
8.065	334.861	04	54	JAN 18,1975	
8.099	334.861	04	56	JAN 18,1975	
8.132	334.861	04	58	JAN 18,1975	
8.166	334.807	05	00	JAN 18,1975	
8.199	334.780	05	02	JAN 18,1975	
8.233	334.834	05	04	JAN 18,1975	
8.266	334.780	05	06	JAN 18,1975	
8.300	334.753	05	08	JAN 18,1975	
8.333	334.753	05	10	JAN 18,1975	
8.366	334.753	05	12	JAN 18,1975	
8.400	334.753	05	14	JAN 18,1975	
8.433	334.699	05	16	JAN 18,1975	
8.467	334.699	05	18	JAN 18,1975	
8.500	334.699	05	20	JAN 18,1975	
8.534	334.699	05	22	JAN 18,1975	
8.567	334.645	05	24	JAN 18,1975	
8.601	334.645	05	26	JAN 18,1975	
8.634	334.645	05	28	JAN 18,1975	
8.668	334.618	05	30	JAN 18,1975	
8.701	334.618	05	32	JAN 18,1975	
8.735	334.591	05	34	JAN 18,1975	
8.768	334.591	05	36	JAN 18,1975	
8.802	334.564	05	38	JAN 18,1975	
8.835	334.564	05	40	JAN 18,1975	
8.868	334.537	05	42	JAN 18,1975	
8.902	334.537	05	44	JAN 18,1975	
8.935	334.483	05	46	JAN 18,1975	
8.969	334.510	05	48	JAN 18,1975	
9.002	334.483	05	50	JAN 18,1975	
9.036	334.483	05	52	JAN 18,1975	
9.069	334.483	05	54	JAN 18,1975	
9.103	334.402	05	56	JAN 18,1975	
9.136	334.402	05	58	JAN 18,1975	
9.170	334.456	06	00	JAN 18,1975	
9.203	334.375	06	02	JAN 18,1975	
9.237	334.375	06	04	JAN 18,1975	
9.270	334.375	06	06	JAN 18,1975	
9.304	334.321	06	08	JAN 18,1975	
9.337	334.321	06	10	JAN 18,1975	

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DELTA TIME	PRESSURE (PSI)	TIME HR MIN	DATE	COMMENTS
9,370	334,294	06 12	JAN 18,1975	
9,404	334,294	06 14	JAN 18,1975	
9,437	334,294	06 16	JAN 18,1975	
9,471	334,267	06 18	JAN 18,1975	
9,504	334,267	06 20	JAN 18,1975	
9,538	334,267	06 22	JAN 18,1975	
9,571	334.186	06 24	JAN 18,1975	
9,605	334,213	06 26	JAN 18,1975	
9,638	334,213	06 28	JAN 18,1975	
9,672	334,186	06 30	JAN 18,1975	
9,705	334.186	06 32	JAN 18,1975	
9,739	334,132	06 34	JAN 18,1975	
9.772	334.105	06 36	JAN 18,1975	
9,806	334,105	06 38	JAN 18,1975	
9,839	334.105	06 40	JAN 18,1975	
9,872	334,051	06 42	JAN 18,1975	
9,906	333,970	06 44	JAN 18,1975	
9,939	333,997	06 46	JAN 18,1975	
9,973	333,943	06 48	JAN 18,1975	
10,006	333,970	06 50	JAN 18,1975	
10,040	333,970	06 52	JAN 18,1975	
10,073	333,916	06 54	JAN 18,1975	
10,107	333.862	06 56	JAN 18,1975	
10,140	333,889	06 58	JAN 18,1975	
10,174	333.889	07 00	JAN 18,1975	
10,207	333,781	07 02	JAN 18,1975	
10,241	333.808	07 04	JAN 18,1975	
10,274	333.835	07 06	JAN 18,1975	
10,308	333,835	07 08	JAN 18,1975	
10.341	333,781	07 10	JAN 18,1975	
10,374	333.727	07 12	JAN 18,1975	
10,408	333,727	07 14	JAN 18,1975	
10,441	333.700	07 16	JAN 18,1975	
10,475	333,700	07 18	JAN 18,1975	
10,508	333,700	07 20	JAN 18,1975	
10,542	333,646	07 23	JAN 18,1975	
10,575	333,673	07 25	JAN 18,1975	
10,609	333,673	07 27	JAN 18,1975	
10,642	333,592	07 29	JAN 18,1975	
10,676	333,673	07 31	JAN 18,1975	

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10,709	333,619	07	33	JAN 18,1975	
10,743	333.538	07	35	JAN 18,1975	
10,776	333.538	07	37	JAN 18,1975	
10.810	333.538	07	39	JAN 18,1975	
10,843	333.511	07	41	JAN 18,1975	
10,876	333,457	07	43	JAN 18,1975	
10,910	333.511	07	45	JAN 18,1975	
10.943	333,484	07	47	JAN 18,1975	
10,977	333,457	07	49	JAN 18,1975	
11,010	333,430	07	51	JAN 18,1975	
11,044	333,511	07	53	JAN 18,1975	
11.077	333,430	07	55	JAN 18,1975	
11.111	333,430	07	57	JAN 18,1975	
11,144	333.430	07	59	JAN 18,1975	
11,178	333,430	08	01	JAN 18,1975	
11,211	333.403	08	03	JAN 18,1975	
11.245	333.538	08	05	JAN 18,1975	
11,278	333.565	08	07	JAN 18,1975	
11,312	333.565	08	09	JAN 18,1975	
11,345	333.538	08	11	JAN 18,1975	
11,378	333,565	08	13	JAN 18,1975	
11,412	333.511	08	15	JAN 18,1975	
11,445	333.538	08	17	JAN 18,1975	
11,479	333.538	08	19	JAN 18,1975	
11,512	333.457	08	21	JAN 18,1975	
11,546	333.511	08	23	JAN 18,1975	
11,579	333.511	08	25	JAN 18,1975	
11,613	333.511	08	27	JAN 18,1975	
11,646	333,511	08	29	JAN 18,1975	
11.680	333,457	08	31	JAN 18,1975	
11,713	333,511	08	33	JAN 18,1975	
11,747	333,538	08	35	JAN 18,1975	
11,780	333.511	08	37	JAN 18,1975	
11,813	333,484	08	39	JAN 18,1975	
11,847	333,511	08	41	JAN 18,1975	
11,880	333.511	08	43	JAN 18,1975	
11,914	333.457	08	45	JAN 18,1975	
11,947	333,511	08	47	JAN 18,1975	
11,981	333,511	08	49	JAN 18,1975	
12,014	333,457	08	51	JAN 18,1975	

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12.048	333.484	08	53	JAN 18,1975	
12.081	333.430	08	55	JAN 18,1975	
12.115	333.484	08	57	JAN 18,1975	
12.148	333.430	08	59	JAN 18,1975	
12.182	333.457	09	01	JAN 18,1975	
12.215	333.376	09	03	JAN 18,1975	
12.249	333.430	09	05	JAN 18,1975	
12.282	333.457	09	07	JAN 18,1975	
12.315	333.484	09	09	JAN 18,1975	
12.349	333.457	09	11	JAN 18,1975	
12.382	333.430	09	13	JAN 18,1975	
12.416	333.403	09	15	JAN 18,1975	
12.449	333.376	09	17	JAN 18,1975	
12.483	333.376	09	19	JAN 18,1975	
12.516	333.376	09	21	JAN 18,1975	
12.550	333.376	09	23	JAN 18,1975	
12.583	333.376	09	25	JAN 18,1975	
12.617	333.349	09	27	JAN 18,1975	
12.650	333.376	09	29	JAN 18,1975	
12.684	333.376	09	31	JAN 18,1975	
12.717	333.376	09	33	JAN 18,1975	
12.751	333.403	09	35	JAN 18,1975	
12.784	333.376	09	37	JAN 18,1975	
12.817	333.376	09	39	JAN 18,1975	
12.851	333.322	09	41	JAN 18,1975	
12.884	333.322	09	43	JAN 18,1975	
12.918	333.349	09	45	JAN 18,1975	
12.951	333.403	09	47	JAN 18,1975	
12.985	333.349	09	49	JAN 18,1975	
13.018	333.430	09	51	JAN 18,1975	
13.052	333.349	09	53	JAN 18,1975	
13.085	333.349	09	55	JAN 18,1975	
13.119	333.349	09	57	JAN 18,1975	
13.152	333.349	09	59	JAN 18,1975	
13.186	333.376	10	01	JAN 18,1975	
13.219	333.376	10	03	JAN 18,1975	
13.253	333.376	10	05	JAN 18,1975	
13.286	333.376	10	07	JAN 18,1975	
13.319	333.376	10	09	JAN 18,1975	
13.353	333.376	10	11	JAN 18,1975	

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DELTA TIME	PRESSURE (PSI)	TIME HR	MIN	DATE	COMMENTS
13,386	333,376	10	13	JAN 18,1975	
13,420	333,376	10	15	JAN 18,1975	
13,453	333,376	10	17	JAN 18,1975	
13,487	333,376	10	19	JAN 18,1975	
13,520	333,349	10	21	JAN 18,1975	
13,554	333,349	10	23	JAN 18,1975	
13,587	333,430	10	25	JAN 18,1975	
13,621	333,322	10	27	JAN 18,1975	
13,654	333,511	10	29	JAN 18,1975	
13,688	333,511	10	31	JAN 18,1975	
13,721	333.511	10	33	JAN 18,1975	
13,755	333.484	10	35	JAN 18,1975	
13,788	333,430	10	37	JAN 18,1975	
13,821	333.376	10	39	JAN 18,1975	
13,855	333,376	10	41	JAN 18,1975	
13,888	333,376	10	43	JAN 18,1975	
13.922	333,403	10	45	JAN 18,1975	
13,955	333.403	10	47	JAN 18,1975	
13,989	333,403	10	49	JAN 18,1975	
14,022	333.403	10	51	JAN 18,1975	
14,056	333,403	10	53	JAN 18,1975	
14,089	333,403	10	55	JAN 18,1975	
14,123	333,403	10	57	JAN 18,1975	
14,156	333,457	10	59	JAN 18,1975	
14.190	333,457	11	01	JAN 18,1975	
14,223	333,457	11	03	JAN 18,1975	
14,257	333,457	11	05	JAN 18,1975	
14.290	333,484	11	07	JAN 18,1975	
14,323	333,484	11	09	JAN 18,1975	
14,357	333.484	11	11	JAN 18,1975	
14,390	333.511	11	13	JAN 18,1975	
14,424	333.430	11	15	JAN 18,1975	
14,457	333,511	11	17	JAN 18,1975	
14,491	333,511	11	19	JAN 18,1975	
14,524	333,511	11	21	JAN 18,1975	
14,558	333,511	11	23	JAN 18,1975	
14,591	333,484	11	25	JAN 18,1975	
14,625	333,484	11	27	JAN 18,1975	
14,658	333,457	11	29	JAN 18,1975	
14,692	333,538	11	31	JAN 18,1975	

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14,725	333,538	11	34	JAN 18,1975	
14,759	333,538	11	36	JAN 18,1975	
14,792	333,511	11	38	JAN 18,1975	
14,825	333,511	11	40	JAN 18,1975	
14,859	333,457	11	42	JAN 18,1975	
14,892	333.511	11	44	JAN 18,1975	
14,926	333,511	11	46	JAN 18,1975	
14,959	333,511	11	48	JAN 18,1975	
14,993	333,511	11	50	JAN 18,1975	
15,026	333,538	11	52	JAN 18,1975	
15,060	333.484	11	54	JAN 18,1975	
15,093	333.511	11	56	JAN 18,1975	
15,127	333.511	11	58	JAN 18,1975	
15,160	333.511	12	00	JAN 18,1975	
15,194	333.511	12	02	JAN 18,1975	
15,227	333.457	12	04	JAN 18,1975	
15.260	333,484	12	06	JAN 18,1975	
15.294	333.457	12	08	JAN 18,1975	
15,327	333,511	12	10	JAN 18,1975	
15,361	333,511	12	12	JAN 18,1975	
15,394	333,511	12	14	JAN 18,1975	
15,428	333,511	12	16	JAN 18,1975	
15,461	333,511	12	18	JAN 18,1975	
15,495	333.511	12	20	JAN 18,1975	
15.528	333,511	12	22	JAN 18,1975	
15,562	333,538	12	24	JAN 18,1975	
15,595	333.430	12	26	JAN 18,1975	
15,629	333.457	12	28	JAN 18,1975	
15.662	333,430	12	30	JAN 18,1975	
15,696	333,430	12	32	JAN 18,1975	
15,729	333,430	12	34	JAN 18,1975	
15,762	333,430	12	36	JAN 18,1975	
15,796	333,430	12	38	JAN 18,1975	
15,829	333,430	12	40	JAN 18,1975	
15,863	333,430	12	42	JAN 18,1975	
15,896	333,376	12	44	JAN 18,1975	
15,930	333,403	12	46	JAN 18,1975	
15,963	333,457	12	48	JAN 18,1975	
15,997	333,430	12	50	JAN 18,1975	
16,030	333,403	12	52	JAN 18,1975	

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 DELTA    PRESSURE                TIME     DATE              COMMENTS
 TIME      (PSI)                 HR MIN

16,064    333,403                12  54 JAN 18,1975
16,097    333,376                12  56 JAN 18,1975
16,131    333,430                12  58 JAN 18,1975
16,164    333,457                13  00 JAN 18,1975
16,198    333,376                13  02 JAN 18,1975
16,231    333,376                13  04 JAN 18,1975
16,264    333,403                13  06 JAN 18,1975
16,298    333,403                13  08 JAN 18,1975
16,331    333,403                13  10 JAN 18,1975
16,365    333,403                13  12 JAN 18,1975
16,398    333,376                13  14 JAN 18,1975
16,432    333,349                13  16 JAN 18,1975
16,465    333,403                13  18 JAN 18,1975
16,499    333,376                13  20 JAN 18,1975
16,532    333,349                13  22 JAN 18,1975
16,566    333,349                13  24 JAN 18,1975
16,599    333,403                13  26 JAN 18,1975
16,633    333,376                13  28 JAN 18,1975
16,666    333,376                13  30 JAN 18,1975
16,700    333,349                13  32 JAN 18,1975
16,733    333,349                13  34 JAN 18,1975
16,766    333,376                13  36 JAN 18,1975
16,800    333,376                13  38 JAN 18,1975
16,833    333,322                13  40 JAN 18,1975
16,867    333,349                13  42 JAN 18,1975
16,900    333,349                13  44 JAN 18,1975
16,934    333,322                13  46 JAN 18,1975
16,967    333,295                13  48 JAN 18,1975
17,001    333,376                13  50 JAN 18,1975
17,034    333,268                13  52 JAN 18,1975
17,068    333,322                13  54 JAN 18,1975
17,101    333,268                13  56 JAN 18,1975
17,135    333,295                13  58 JAN 18,1975
17,168    333,295                14  00 JAN 18,1975
17,202    333,214                14  02 JAN 18,1975

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17,202    333,187                14  02 JAN 18,1975
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17,268	333,214	14	06	JAN 18,1975	
17,302	333,160	14	08	JAN 18,1975	
17,335	333,376	14	10	JAN 18,1975	
17,369	333,295	14	12	JAN 18,1975	
17,402	333.187	14	14	JAN 18,1975	
17,436	333,214	14	16	JAN 18,1975	
17,469	333.160	14	18	JAN 18,1975	
17.503	333,106	14	20	JAN 18,1975	
17,536	333,214	14	22	JAN 18,1975	
17,570	333,133	14	24	JAN 18,1975	
17,603	333.052	14	26	JAN 18,1975	
17,637	333,106	14	28	JAN 18,1975	
17.670	333,079	14	30	JAN 18,1975	
17.704	332,998	14	32	JAN 18,1975	
17,737	332,998	14	34	JAN 18,1975	
17,770	332,998	14	36	JAN 18,1975	
17,804	332,944	14	38	JAN 18,1975	
17,837	332.971	14	40	JAN 18,1975	
17.871	332.944	14	42	JAN 18,1975	
17.904	332,944	14	44	JAN 18,1975	
17,938	332,917	14	46	JAN 18,1975	
17,971	332,836	14	48	JAN 18,1975	
18,005	332,836	14	50	JAN 18,1975	
18,038	332,836	14	52	JAN 18,1975	
18,072	332,836	14	54	JAN 18,1975	
18.105	332,836	14	56	JAN 18,1975	
18,139	332.782	14	58	JAN 18,1975	
18,172	332,809	15	00	JAN 18,1975	
18,206	332,809	15	02	JAN 18,1975	
18,239	332,782	15	04	JAN 18,1975	
18.272	332,782	15	06	JAN 18,1975	
18,306	332,755	15	08	JAN 18,1975	
18.339	332,701	15	10	JAN 18,1975	
18,373	332,755	15	12	JAN 18,1975	
18,406	332,728	15	14	JAN 18,1975	
18,440	332,809	15	16	JAN 18,1975	
18,473	332,728	15	18	JAN 18,1975	
18,507	332,755	15	20	JAN 18,1975	
18,540	332,701	15	22	JAN 18,1975	
18,574	332,755	15	24	JAN 18,1975	

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18,607	332,755	15	26	JAN 18,1975	
18,641	332,701	15	28	JAN 18,1975	
18,674	332,728	15	30	JAN 18,1975	
18,707	332,620	15	32	JAN 18,1975	
18,741	332,674	15	34	JAN 18,1975	
18,774	332,620	15	36	JAN 18,1975	
18.808	332.566	15	38	JAN 18,1975	
18,841	332.647	15	40	JAN 18,1975	
18,875	332,674	15	42	JAN 18,1975	
18,908	332,674	15	44	JAN 18,1975	
18,942	332.674	15	47	JAN 18,1975	
18,975	332.701	15	49	JAN 18,1975	
19,009	332,647	15	51	JAN 18,1975	
19,042	332,620	15	53	JAN 18,1975	
19.076	332.620	15	55	JAN 18,1975	
19,109	332.674	15	57	JAN 18,1975	
19.143	332.647	15	59	JAN 18,1975	
19,176	332.620	16	01	JAN 18,1975	
19,209	332.728	16	03	JAN 18,1975	
19,243	332.755	16	05	JAN 18,1975	
19,276	332.701	16	07	JAN 18,1975	
19.310	332,701	16	09	JAN 18,1975	
19,343	332,701	16	11	JAN 18,1975	
19,377	332,701	16	13	JAN 18,1975	
19.410	332,782	16	15	JAN 18,1975	
19,444	332,836	16	17	JAN 18,1975	
19.477	332,782	16	19	JAN 18,1975	
19,511	332,863	16	21	JAN 18,1975	
19,544	332,755	16	23	JAN 18,1975	
19,578	332.782	16	25	JAN 18,1975	
19,611	332,809	16	27	JAN 18,1975	
19,645	332,809	16	29	JAN 18,1975	
19,678	332.809	16	31	JAN 18,1975	
19,711	332.755	16	33	JAN 18,1975	
19,745	332,782	16	35	JAN 18,1975	
19,778	332,809	16	37	JAN 18,1975	
19,812	332,782	16	39	JAN 18,1975	
19,845	332,782	16	41	JAN 18,1975	
19,879	332,782	16	43	JAN 18,1975	
19,912	332,755	16	45	JAN 18,1975	

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19,946	332,728	16	47	JAN 18,1975	
19,979	332,782	16	49	JAN 18,1975	
20,013	332,782	16	51	JAN 18,1975	
20,046	332,782	16	53	JAN 18,1975	
20,080	332,782	16	55	JAN 18,1975	
20,113	332.728	16	57	JAN 18,1975	
20,147	332.782	16	59	JAN 18,1975	
20.180	332,728	17	01	JAN 18,1975	
20.213	332,782	17	03	JAN 18,1975	
20,247	332,728	17	05	JAN 18,1975	
20,280	332,755	17	07	JAN 18,1975	
20,314	332.674	17	09	JAN 18,1975	
20,347	332.755	17	11	JAN 18,1975	
20,381	332.728	17	13	JAN 18,1975	
20,414	332,701	17	15	JAN 18,1975	
20,448	332,701	17	17	JAN 18,1975	
20,481	332.755	17	19	JAN 18,1975	
20.515	332.701	17	21	JAN 18,1975	
20,548	332.674	17	23	JAN 18,1975	
20.582	332,674	17	25	JAN 18,1975	
20,615	332,674	17	27	JAN 18,1975	
20,649	332,674	17	29	JAN 18,1975	
20,682	332.647	17	31	JAN 18,1975	
20,715	332,674	17	33	JAN 18,1975	
20,749	332,647	17	35	JAN 18,1975	
20,782	332,647	17	37	JAN 18,1975	
20,816	332.620	17	39	JAN 18,1975	
20,849	332.620	17	41	JAN 18,1975	
20,883	332,620	17	43	JAN 18,1975	
20,916	332.566	17	45	JAN 18,1975	
20,950	332.566	17	47	JAN 18,1975	
20,983	332.566	17	49	JAN 18,1975	
21,017	332.647	17	51	JAN 18,1975	
21,050	332.566	17	53	JAN 18,1975	
21,084	332.593	17	55	JAN 18,1975	
21,117	332,512	17	57	JAN 18,1975	
21.151	332.512	17	59	JAN 18,1975	
21,184	332.566	18	01	JAN 18,1975	
21.217	332.512	18	03	JAN 18,1975	
21,251	332,485	18	05	JAN 18,1975	

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21,284	332,485	18	07	JAN 18,1975	
21,318	332,458	18	09	JAN 18,1975	
21,351	332,485	18	11	JAN 18,1975	
21,385	332,431	18	13	JAN 18,1975	
21,418	332,485	18	15	JAN 18,1975	
21,452	332,458	18	17	JAN 18,1975	
21,485	332,404	18	19	JAN 18,1975	
21,519	332.431	18	21	JAN 18,1975	
21,552	332,458	18	23	JAN 18,1975	
21,586	332,350	18	25	JAN 18,1975	
21,619	332,404	18	27	JAN 18,1975	
21,653	332,431	18	29	JAN 18,1975	
21,686	332,377	18	31	JAN 18,1975	
21,719	332,377	18	33	JAN 18,1975	
21,753	332.377	18	35	JAN 18,1975	
21.786	332.377	18	37	JAN 18,1975	
21.820	332,404	18	39	JAN 18,1975	
21,853	332.404	18	41	JAN 18,1975	
21,887	332,404	18	43	JAN 18,1975	
21.920	332,377	18	45	JAN 18,1975	
21,954	332,404	18	47	JAN 18,1975	
21,987	332,377	18	49	JAN 18,1975	
22.021	332,323	18	51	JAN 18,1975	
22.054	332,296	18	53	JAN 18,1975	
22,088	332,350	18	55	JAN 18,1975	
22,121	332,296	18	57	JAN 18,1975	
22,154	332,269	18	59	JAN 18,1975	
22,188	332,215	19	01	JAN 18,1975	
22,221	332,269	19	03	JAN 18,1975	
22,255	332,188	19	05	JAN 18,1975	
22,288	332,242	19	07	JAN 18,1975	
22,322	332,323	19	09	JAN 18,1975	
22,355	332,188	19	11	JAN 18,1975	
22,389	332,188	19	13	JAN 18,1975	
22,422	332,161	19	15	JAN 18,1975	
22,456	332.188	19	17	JAN 18,1975	
22,489	332,107	19	19	JAN 18,1975	
22,523	332,107	19	21	JAN 18,1975	
22,556	332,053	19	23	JAN 18,1975	
22,590	332,107	19	25	JAN 18,1975	

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22,623	332,134	19 27	JAN 18,1975	
22,656	332,188	19 29	JAN 18,1975	
22,690	332,134	19 31	JAN 18,1975	
22,723	332,107	19 33	JAN 18,1975	
22,757	332,161	19 35	JAN 18,1975	
22,790	332,134	19 37	JAN 18,1975	
22,824	332,107	19 39	JAN 18,1975	
22,857	332,080	19 41	JAN 18,1975	
22,891	332.053	19 43	JAN 18,1975	
22.924	332,107	19 45	JAN 18,1975	
22,958	332,053	19 47	JAN 18,1975	
22,991	332.080	19 49	JAN 18,1975	
23,025	332.026	19 51	JAN 18,1975	
23.058	332,053	19 53	JAN 18,1975	
23,092	331,972	19 55	JAN 18,1975	
23,125	332,053	19 58	JAN 18,1975	
23,158	332,026	20 00	JAN 18,1975	
23.192	331.999	20 02	JAN 18,1975	
23,225	331,972	20 04	JAN 18,1975	
23,259	332,026	20 06	JAN 18,1975	
23,292	332,026	20 08	JAN 18,1975	
23,326	331.999	20 10	JAN 18,1975	
23,359	331,918	20 12	JAN 18,1975	
23,393	332,026	20 14	JAN 18,1975	
23,426	331,945	20 16	JAN 18,1975	
23,460	331,945	20 18	JAN 18,1975	
23,493	331,945	20 20	JAN 18,1975	
23,527	331,945	20 22	JAN 18,1975	
23,560	331,945	20 24	JAN 18,1975	
23,594	332.350	20 26	JAN 18,1975	
23.627	332,188	20 28	JAN 18,1975	
23,660	332,080	20 30	JAN 18,1975	
23,694	332.053	20 32	JAN 18,1975	
23,727	332,053	20 34	JAN 18,1975	
23,761	331,972	20 36	JAN 18,1975	
23,794	331,999	20 38	JAN 18,1975	
23,828	331,999	20 40	JAN 18,1975	
23,861	331,999	20 42	JAN 18,1975	
23,895	331.945	20 44	JAN 18,1975	
23,928	331,972	20 46	JAN 18,1975	

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23.962	332.026	20	48	JAN 18,1975	
23.995	331.945	20	50	JAN 18,1975	
24.029	331.945	20	52	JAN 18,1975	
24.062	331.945	20	54	JAN 18,1975	
24.096	331.891	20	56	JAN 18,1975	
24.129	331.918	20	58	JAN 18,1975	
24.162	331.918	21	00	JAN 18,1975	END JETTING IN
24.196	332.620	21	02	JAN 18,1975	SG 1A START
24.229	333.808	21	04	JAN 18,1975	RECOVERY
24.263	334.564	21	06	JAN 18,1975	
24.296	335.131	21	08	JAN 18,1975	
24.330	335.617	21	10	JAN 18,1975	
24.363	335.995	21	12	JAN 18,1975	
24.397	336.346	21	14	JAN 18,1975	
24.430	336.643	21	16	JAN 18,1975	
24.464	336.940	21	18	JAN 18,1975	
24.497	337.156	21	20	JAN 18,1975	
24.531	337.426	21	22	JAN 18,1975	
24.564	337.642	21	24	JAN 18,1975	
24.598	337.858	21	26	JAN 18,1975	
24.631	338.101	21	28	JAN 18,1975	
24.664	338.262	21	30	JAN 18,1975	
24.698	338.397	21	32	JAN 18,1975	
24.731	338.559	21	34	JAN 18,1975	
24.765	338.775	21	36	JAN 18,1975	
24.798	338.910	21	38	JAN 18,1975	
24.832	339.018	21	40	JAN 18,1975	
24.865	339.261	21	42	JAN 18,1975	
24.899	339.315	21	44	JAN 18,1975	
24.932	339.477	21	46	JAN 18,1975	
24.966	339.585	21	48	JAN 18,1975	
24.999	339.666	21	50	JAN 18,1975	
25.033	339.774	21	52	JAN 18,1975	
25.066	339.936	21	54	JAN 18,1975	
25.099	340.071	21	56	JAN 18,1975	
25.133	340.152	21	58	JAN 18,1975	
25.166	340.368	22	00	JAN 18,1975	END TEST

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PREPARED FOR

ATLANTIC RICHFIELD COMPANY

WELL NUMBER	FEDERAL SG-1
FIELD/LEASE	SORGHUM GULCH TRACT CB
COUNTY/PARISH	RIO BLANCO
STATE	COLORADO
TYPE OF TEST	MULTIPLE PACKER DST
REFERENCE ELEV	GROUND LEVEL

ADDITIONAL INFORMATICN

GAUGE NO. 193 RAN WITH 1400 LBS. ELEMENT INSIDE

DRILL PIPE.

GAUGE DEPTH WAS AT 921 FT. AND PACKER WAS SET AT

907 FT. (TOP PACKER)

INITIAL HYDROSTATIC PRESSURE WAS 354.72 PSI.

FINAL HYDROSTATIC PRESSURE WAS 354.42 PSI.

GROUND LEVEL REFERENCE IS 6426 FT. APPROX.

THE TEST INTERVAL WAS FROM 907 FT. TO 944 FT.

JETTING WAS DONE ON SG-1A WHICH IS 100 FT.

(SURFACE) AWAY FROM SG-1.

755 POINTS REPORTED THIS JOB

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DELTA	PRESSURE	TIME		DATE	COMMENTS
TIME	(PSI)	HR	MIN		
0,000	363,142	20	50	JAN 17,1975	ON BOTTOM
,033	363,206	20	52	JAN 17,1975	
,067	363,302	20	54	JAN 17,1975	
,100	363,271	20	56	JAN 17,1975	
,134	363,304	20	58	JAN 17,1975	
,167	363,274	21	00	JAN 17,1975	START JETTING
,200	363,622	21	02	JAN 17,1975	IN SG-1A
,234	362,298	21	04	JAN 17,1975	
,267	360,784	21	06	JAN 17,1975	
,300	359,839	21	08	JAN 17,1975	
,334	359,114	21	10	JAN 17,1975	
,367	358,484	21	12	JAN 17,1975	
,401	358,012	21	14	JAN 17,1975	
,434	357,539	21	16	JAN 17,1975	
,467	357,162	21	18	JAN 17,1975	
,501	356,816	21	20	JAN 17,1975	
,534	356,501	21	22	JAN 17,1975	
,567	356,187	21	24	JAN 17,1975	
,601	355,967	21	26	JAN 17,1975	
,634	355,716	21	28	JAN 17,1975	
,668	355,464	21	30	JAN 17,1975	
,701	355,244	21	32	JAN 17,1975	
,734	355,056	21	34	JAN 17,1975	
,768	354,868	21	36	JAN 17,1975	
,801	354,648	21	38	JAN 17,1975	
,834	354,523	21	40	JAN 17,1975	
,868	354,335	21	42	JAN 17,1975	
,901	354,146	21	44	JAN 17,1975	
,935	353,958	21	46	JAN 17,1975	
,968	353,833	21	48	JAN 17,1975	
1,001	353,676	21	50	JAN 17,1975	
1,035	353,488	21	52	JAN 17,1975	
1,068	353,363	21	54	JAN 17,1975	
1,101	353,238	21	56	JAN 17,1975	
1,135	353,144	21	58	JAN 17,1975	
1,168	352,987	22	00	JAN 17,1975	
1,202	352,862	22	02	JAN 17,1975	
1,235	352,705	22	04	JAN 17,1975	
1,268	352,643	22	06	JAN 17,1975	
1,302	352,487	22	08	JAN 17,1975	

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1,335	352.425	22	10	JAN 17,1975	
1,368	352,268	22	12	JAN 17,1975	
1,402	352.143	22	14	JAN 17,1975	
1,435	352.081	22	16	JAN 17,1975	
1,469	352.018	22	18	JAN 17,1975	
1,502	351,893	22	20	JAN 17,1975	
1,535	351,800	22	22	JAN 17,1975	
1,569	351.706	22	24	JAN 17,1975	
1,602	351.612	22	26	JAN 17,1975	
1,635	351,519	22	28	JAN 17,1975	
1,669	351.394	22	30	JAN 17,1975	
1,702	351.300	22	32	JAN 17,1975	
1,736	351.301	22	34	JAN 17,1975	
1,769	351.176	22	36	JAN 17,1975	
1,802	351.114	22	38	JAN 17,1975	
1,836	351.052	22	40	JAN 17,1975	
1,869	350.958	22	42	JAN 17,1975	
1,902	350.833	22	44	JAN 17,1975	
1,936	350,771	22	46	JAN 17,1975	
1,969	350.772	22	48	JAN 17,1975	
2,003	350,647	22	50	JAN 17,1975	
2.036	350.585	22	52	JAN 17,1975	
2,069	350.523	22	54	JAN 17,1975	
2,103	350.461	22	56	JAN 17,1975	
2.136	350.367	22	58	JAN 17,1975	
2,170	350.305	23	00	JAN 17,1975	
2,203	350.211	23	02	JAN 17,1975	
2,236	350,181	23	04	JAN 17,1975	
2,270	350,024	23	06	JAN 17,1975	
2,303	349,931	23	08	JAN 17,1975	
2,336	349.900	23	10	JAN 17,1975	
2,370	349.870	23	12	JAN 17,1975	
2,403	349.839	23	14	JAN 17,1975	
2,437	349.777	23	16	JAN 17,1975	
2,470	349.715	23	18	JAN 17,1975	
2,503	349,621	23	20	JAN 17,1975	
2,537	349.622	23	22	JAN 17,1975	
2,570	349,529	23	24	JAN 17,1975	
2,603	349,498	23	26	JAN 17,1975	
2,637	349,405	23	28	JAN 17,1975	

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2,670	349,374	23	30	JAN 17,1975	
2,704	349,375	23	32	JAN 17,1975	
2,737	349,281	23	34	JAN 17,1975	
2,770	349,251	23	36	JAN 17,1975	
2,804	349,220	23	38	JAN 17,1975	
2,837	349,127	23	40	JAN 17,1975	
2,870	349,096	23	42	JAN 17,1975	
2,904	349,034	23	44	JAN 17,1975	
2,937	349,035	23	46	JAN 17,1975	
2,971	348,973	23	48	JAN 17,1975	
3,004	348,974	23	50	JAN 17,1975	
3,037	348,881	23	52	JAN 17,1975	
3,071	348.787	23	54	JAN 17,1975	
3,104	348.788	23	56	JAN 17,1975	
3,137	348,758	23	58	JAN 17,1975	
3,171	348,727	00	00	JAN 18,1975	
3,204	348,697	00	02	JAN 18,1975	
3,238	348,634	00	04	JAN 18,1975	
3,271	348,572	00	06	JAN 18,1975	
3,304	348,573	00	08	JAN 18,1975	
3,338	348,543	00	10	JAN 18,1975	
3,371	348,481	00	12	JAN 18,1975	
3,404	348,450	00	14	JAN 18,1975	
3,438	348,420	00	16	JAN 18,1975	
3,471	348.389	00	18	JAN 18,1975	
3,505	348,296	00	20	JAN 18,1975	
3,538	348,297	00	22	JAN 18,1975	
3,571	348,235	00	24	JAN 18,1975	
3,605	348,173	00	26	JAN 18,1975	
3,638	348.142	00	28	JAN 18,1975	
3,671	348,143	00	30	JAN 18,1975	
3,705	348,113	00	32	JAN 18,1975	
3,738	348,051	00	34	JAN 18,1975	
3,772	348,083	00	36	JAN 18,1975	
3,805	348,084	00	38	JAN 18,1975	
3,838	348,085	00	40	JAN 18,1975	
3,872	348,023	00	42	JAN 18,1975	
3,905	347,961	00	44	JAN 18,1975	
3,938	347,962	00	46	JAN 18,1975	
3,972	347,963	00	48	JAN 18,1975	

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4.005	347.870	00	50	JAN 18,1975	
4.039	347.808	00	52	JAN 18,1975	
4.072	347.840	00	54	JAN 18,1975	
4.105	347.778	00	56	JAN 18,1975	
4.139	347.748	00	58	JAN 18,1975	
4.172	347.717	01	00	JAN 18,1975	
4.206	347.687	01	02	JAN 18,1975	
4.239	347.625	01	04	JAN 18,1975	
4.272	347.594	01	06	JAN 18,1975	
4.306	347.532	01	08	JAN 18,1975	
4.339	347.533	01	10	JAN 18,1975	
4.372	347.534	01	12	JAN 18,1975	
4.406	347.472	01	14	JAN 18,1975	
4.439	347.347	01	16	JAN 18,1975	
4.473	347.379	01	18	JAN 18,1975	
4.506	347.380	01	20	JAN 18,1975	
4.539	347.287	01	22	JAN 18,1975	
4.573	347.256	01	24	JAN 18,1975	
4.606	347.226	01	26	JAN 18,1975	
4.639	347.195	01	28	JAN 18,1975	
4.673	347.165	01	30	JAN 18,1975	
4.706	347.134	01	32	JAN 18,1975	
4.740	347.104	01	34	JAN 18,1975	
4.773	347.105	01	36	JAN 18,1975	
4.806	347.043	01	38	JAN 18,1975	
4.840	347.044	01	40	JAN 18,1975	
4.873	347.013	01	42	JAN 18,1975	
4.906	347.014	01	44	JAN 18,1975	
4.940	346.984	01	46	JAN 18,1975	
4.973	346.890	01	48	JAN 18,1975	
5.007	346.891	01	50	JAN 18,1975	
5.040	346.924	01	52	JAN 18,1975	
5.073	346.862	01	54	JAN 18,1975	
5.107	346.831	01	56	JAN 18,1975	
5.140	346.801	01	58	JAN 18,1975	
5.173	346.802	02	00	JAN 18,1975	
5.207	346.771	02	02	JAN 18,1975	
5.240	346.709	02	04	JAN 18,1975	
5.274	346.710	02	06	JAN 18,1975	
5.307	346.648	02	08	JAN 18,1975	

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5,340	346,618	02	10	JAN 18,1975	
5,374	346,619	02	12	JAN 18,1975	
5,407	346,588	02	14	JAN 18,1975	
5,440	346,558	02	16	JAN 18,1975	
5,474	346,527	02	18	JAN 18,1975	
5,507	346,497	02	20	JAN 18,1975	
5,541	346,498	02	22	JAN 18,1975	
5,574	346,499	02	24	JAN 18,1975	
5,607	346,437	02	26	JAN 18,1975	
5,641	346,438	02	28	JAN 18,1975	
5,674	346.407	02	30	JAN 18,1975	
5,707	346.440	02	32	JAN 18,1975	
5,741	346.409	02	34	JAN 18,1975	
5,774	346.316	02	36	JAN 18,1975	
5,808	346.317	02	38	JAN 18,1975	
5,841	346,318	02	40	JAN 18,1975	
5,874	346,287	02	42	JAN 18,1975	
5,908	346.288	02	44	JAN 18,1975	
5,941	346,289	02	46	JAN 18,1975	
5,974	346,227	02	48	JAN 18,1975	
6,008	346,228	02	50	JAN 18,1975	
6,041	346.198	02	52	JAN 18,1975	
6.075	346,167	02	54	JAN 18,1975	
6,108	346.137	02	56	JAN 18,1975	
6,141	346,138	02	58	JAN 18,1975	
6,175	346,076	03	00	JAN 18,1975	
6,208	346.108	03	02	JAN 18,1975	
6,241	346.046	03	04	JAN 18,1975	
6,275	345,984	03	06	JAN 18,1975	
6.308	345,985	03	08	JAN 18,1975	
6,342	345.955	03	10	JAN 18,1975	
6,375	345.987	03	13	JAN 18,1975	
6,408	345,957	03	15	JAN 18,1975	
6,442	345,895	03	17	JAN 18,1975	
6,475	345,896	03	19	JAN 18,1975	
6,509	345,897	03	21	JAN 18,1975	
6,542	345.866	03	23	JAN 18,1975	
6,575	345,804	03	25	JAN 18,1975	
6,609	345.805	03	27	JAN 18,1975	
6,642	345,838	03	29	JAN 18,1975	

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TIME      (PSI)               HR MIN

6,675     345,744             03   31 JAN 18,1975
6,709     345,745             03   33 JAN 18,1975
6,742     345,715             03   35 JAN 18,1975
6,776     345,747             03   37 JAN 18,1975
6,809     345,685             03   39 JAN 18,1975
6,842     345,718             03   41 JAN 18,1975
6,876     345,751             03   43 JAN 18,1975
6,909     345,720             03   45 JAN 18,1975
6,942     345,658             03   47 JAN 18,1975
6,976     345,627             03   49 JAN 18,1975
7,009     345,628             03   51 JAN 18,1975
7,043     345.630             03   53 JAN 18,1975
7,076     345.567             03   55 JAN 18,1975
7,109     345.632             03   57 JAN 18,1975
7,143     345.633             03   59 JAN 18,1975
7,176     345.602             04   01 JAN 18,1975
7,209     345.540             04   03 JAN 18,1975
7.243     345.510             04   05 JAN 18,1975
7,276     345.574             04   07 JAN 18,1975
7,310     345,575             04   09 JAN 18,1975
7,343     345.544             04   11 JAN 18,1975
7,376     345.514             04   13 JAN 18,1975
7,410     345,515             04   15 JAN 18,1975
7,443     345,516             04   17 JAN 18,1975
7,476     345,454             04   19 JAN 18,1975
7.510     345,392             04   21 JAN 18,1975
7,543     345.487             04   23 JAN 18,1975
7,577     345,425             04   25 JAN 18,1975
7,610     345,395             04   27 JAN 18,1975
7,643     345,396             04   29 JAN 18,1975
7,677     345,365             04   31 JAN 18,1975
7,710     345,398             04   33 JAN 18,1975
7,743     345,399             04   35 JAN 18,1975
7,777     345,337             04   37 JAN 18,1975
7,810     345,338             04   39 JAN 18,1975
7,844     345,339             04   41 JAN 18,1975
7,877     345.340             04   43 JAN 18,1975
7,910     345,341             04   45 JAN 18,1975
7,944     345,279             04   47 JAN 18,1975
7,977     345,312             04   49 JAN 18,1975
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8,010	345,250	04	51	JAN 18,1975	
8,044	345,219	04	53	JAN 18,1975	
8,077	345,220	04	55	JAN 18,1975	
8,111	345,190	04	57	JAN 18,1975	
8,144	345,191	04	59	JAN 18,1975	
8,177	345,129	05	01	JAN 18,1975	
8,211	345,130	05	03	JAN 18,1975	
8,244	345,131	05	05	JAN 18,1975	
8,277	345,100	05	07	JAN 18,1975	
8,311	345,101	05	09	JAN 18,1975	
8,344	345,134	05	11	JAN 18,1975	
8,378	345,103	05	13	JAN 18,1975	
8,411	345.167	05	15	JAN 18,1975	
8,444	345,074	05	17	JAN 18,1975	
8,478	345,043	05	19	JAN 18,1975	
8,511	345.076	05	21	JAN 18,1975	
8,545	345.045	05	23	JAN 18,1975	
8.578	345,046	05	25	JAN 18,1975	
8,611	344,953	05	27	JAN 18,1975	
8,645	344,954	05	29	JAN 18,1975	
8,678	344,923	05	31	JAN 18,1975	
8,711	344,893	05	33	JAN 18,1975	
8,745	344,894	05	35	JAN 18,1975	
8,778	344,895	05	37	JAN 18,1975	
8,812	344,896	05	39	JAN 18,1975	
8,845	344,865	05	41	JAN 18,1975	
8,878	344,866	05	43	JAN 18,1975	
8,912	344,836	05	45	JAN 18,1975	
8,945	344,837	05	47	JAN 18,1975	
8,978	344,806	05	49	JAN 18,1975	
9,012	344,807	05	51	JAN 18,1975	
9,045	344,777	05	53	JAN 18,1975	
9,079	344,810	05	55	JAN 18,1975	
9,112	344,716	05	57	JAN 18,1975	
9,145	344,717	05	59	JAN 18,1975	
9,179	344,718	06	01	JAN 18,1975	
9,212	344,719	06	03	JAN 18,1975	
9,245	344,625	06	05	JAN 18,1975	
9,279	344,690	06	07	JAN 18,1975	
9,312	344,691	06	09	JAN 18,1975	

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9,346	344,660	06	11	JAN 18,1975	
9,379	344,598	06	13	JAN 18,1975	
9,412	344,631	06	15	JAN 18,1975	
9,446	344,663	06	17	JAN 18,1975	
9,479	344,633	06	19	JAN 18,1975	
9,512	344,602	06	21	JAN 18,1975	
9,546	344,603	06	23	JAN 18,1975	
9,579	344,573	06	25	JAN 18,1975	
9,613	344.542	06	27	JAN 18,1975	
9,646	344,512	06	29	JAN 18,1975	
9,679	344,513	06	31	JAN 18,1975	
9,713	344,514	06	33	JAN 18,1975	
9,746	344.483	06	35	JAN 18,1975	
9,779	344,421	06	37	JAN 18,1975	
9,813	344,454	06	39	JAN 18,1975	
9,846	344.392	06	41	JAN 18,1975	
9,880	344,361	06	43	JAN 18,1975	
9,913	344,299	06	45	JAN 18,1975	
9,946	344,332	06	47	JAN 18,1975	
9,980	344,270	06	49	JAN 18,1975	
10,013	344,271	06	51	JAN 18,1975	
10,046	344,272	06	53	JAN 18,1975	
10,080	344,273	06	55	JAN 18,1975	
10,113	344,179	06	57	JAN 18,1975	
10,147	344.212	06	59	JAN 18,1975	
10.180	344,213	07	01	JAN 18,1975	
10,213	344,182	07	03	JAN 18,1975	
10.247	344,215	07	05	JAN 18,1975	
10,280	344.121	07	07	JAN 18,1975	
10,313	344,154	07	09	JAN 18,1975	
10,347	344,155	07	11	JAN 18,1975	
10,380	344.124	07	13	JAN 18,1975	
10,414	344,031	07	15	JAN 18,1975	
10,447	344,127	07	17	JAN 18,1975	
10,480	344,096	07	19	JAN 18,1975	
10,514	344,097	07	21	JAN 18,1975	
10,547	344,098	07	23	JAN 18,1975	
10,581	344,068	07	25	JAN 18,1975	
10,614	344,037	07	27	JAN 18,1975	
10,647	344,038	07	29	JAN 18,1975	

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TIME	(PSI)	HR	MIN		
10,681	344,008	07	31	JAN 18,1975	
10,714	344,009	07	33	JAN 18,1975	
10,747	343,947	07	35	JAN 18,1975	
10,781	344,011	07	37	JAN 18,1975	
10,814	343,980	07	39	JAN 18,1975	
10,848	343,918	07	41	JAN 18,1975	
10,881	343,982	07	43	JAN 18,1975	
10,914	343,952	07	45	JAN 18,1975	
10.948	343.921	07	47	JAN 18,1975	
10,981	343,954	07	49	JAN 18,1975	
11,014	343.892	07	51	JAN 18,1975	
11.048	343.924	07	53	JAN 18,1975	
11,081	343,925	07	55	JAN 18,1975	
11.115	343,927	07	57	JAN 18,1975	
11,148	343.896	07	59	JAN 18,1975	
11.181	343,992	08	01	JAN 18,1975	
11,215	344.056	08	03	JAN 18,1975	
11.248	343.994	08	05	JAN 18,1975	
11,281	344.026	08	07	JAN 18,1975	
11,315	343,996	08	09	JAN 18,1975	
11,348	344.028	08	11	JAN 18,1975	
11,382	344,030	08	13	JAN 18,1975	
11,415	343,999	08	15	JAN 18,1975	
11,448	344.000	08	17	JAN 18,1975	
11,482	344.001	08	19	JAN 18,1975	
11,515	344.002	08	21	JAN 18,1975	
11,548	344,035	08	23	JAN 18,1975	
11,582	343,973	08	25	JAN 18,1975	
11,615	344,005	08	27	JAN 18,1975	
11,649	343,943	08	29	JAN 18,1975	
11,682	343,976	08	31	JAN 18,1975	
11,715	344,008	08	33	JAN 18,1975	
11,749	344,009	08	35	JAN 18,1975	
11,782	343,979	08	37	JAN 18,1975	
11,815	343.948	08	39	JAN 18,1975	
11,849	343,949	08	41	JAN 18,1975	
11,882	343,919	08	43	JAN 18,1975	
11,916	343,952	08	45	JAN 18,1975	
11,949	343,889	08	47	JAN 18,1975	
11,982	343,922	08	49	JAN 18,1975	

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12,016	343,892	08	51	JAN 18,1975	
12,049	343,893	08	53	JAN 18,1975	
12,082	343,894	08	55	JAN 18,1975	
12,116	343,895	08	57	JAN 18,1975	
12,149	343,896	08	59	JAN 18,1975	
12,183	343,834	09	01	JAN 18,1975	
12,216	343,866	09	03	JAN 18,1975	
12,249	343.899	09	05	JAN 18,1975	
12,283	343,868	09	07	JAN 18,1975	
12,316	343,838	09	09	JAN 18,1975	
12,349	343,934	09	11	JAN 18,1975	
12,383	343.871	09	13	JAN 18,1975	
12,416	343,841	09	15	JAN 18,1975	
12.450	343,779	09	17	JAN 18,1975	
12.483	343.843	09	19	JAN 18,1975	
12.516	343.844	09	21	JAN 18,1975	
12,550	343,845	09	23	JAN 18,1975	
12,583	343,846	09	25	JAN 18,1975	
12,617	343.879	09	27	JAN 18,1975	
12,650	343.817	09	29	JAN 18,1975	
12,683	343,818	09	31	JAN 18,1975	
12,717	343,819	09	33	JAN 18,1975	
12,750	343.820	09	35	JAN 18,1975	
12,783	343.821	09	37	JAN 18,1975	
12,817	343,822	09	39	JAN 18,1975	
12,850	343,823	09	41	JAN 18,1975	
12,884	343,824	09	43	JAN 18,1975	
12,917	343,825	09	45	JAN 18,1975	
12,950	343,826	09	47	JAN 18,1975	
12,984	343,859	09	49	JAN 18,1975	
13,017	343,860	09	51	JAN 18,1975	
13,050	343,861	09	53	JAN 18,1975	
13,084	343,893	09	55	JAN 18,1975	
13,117	343.831	09	57	JAN 18,1975	
13,151	343,864	09	59	JAN 18,1975	
13,184	343,833	10	01	JAN 18,1975	
13,217	343,866	10	03	JAN 18,1975	
13,251	343,835	10	05	JAN 18,1975	
13,284	343,836	10	07	JAN 18,1975	
13,317	343,869	10	09	JAN 18,1975	

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13.351	343.870	10	11	JAN 18,1975	
13.384	343.840	10	13	JAN 18,1975	
13.418	343.841	10	15	JAN 18,1975	
13.451	343.842	10	17	JAN 18,1975	
13.484	343.843	10	19	JAN 18,1975	
13.518	343.812	10	21	JAN 18,1975	
13.551	343.813	10	23	JAN 18,1975	
13.584	343.783	10	25	JAN 18,1975	
13.618	344.068	10	27	JAN 18,1975	
13.651	343.974	10	29	JAN 18,1975	
13.685	343.944	10	31	JAN 18,1975	
13.718	343.913	10	33	JAN 18,1975	
13.751	343.883	10	35	JAN 18,1975	
13.785	343.852	10	37	JAN 18,1975	
13.818	343.822	10	39	JAN 18,1975	
13.851	343.854	10	41	JAN 18,1975	
13.885	343.887	10	43	JAN 18,1975	
13.918	343.825	10	45	JAN 18,1975	
13.952	343.857	10	47	JAN 18,1975	
13.985	343.890	10	49	JAN 18,1975	
14.018	343.891	10	51	JAN 18,1975	
14.052	343.892	10	53	JAN 18,1975	
14.085	343.893	10	55	JAN 18,1975	
14.118	343.894	10	57	JAN 18,1975	
14.152	343.958	10	59	JAN 18,1975	
14.185	343.959	11	01	JAN 18,1975	
14.219	343.960	11	03	JAN 18,1975	
14.252	343.993	11	05	JAN 18,1975	
14.285	343.994	11	07	JAN 18,1975	
14.319	343.932	11	09	JAN 18,1975	
14.352	343.996	11	11	JAN 18,1975	
14.385	343.997	11	13	JAN 18,1975	
14.419	343.998	11	15	JAN 18,1975	
14.452	343.968	11	17	JAN 18,1975	
14.486	344.000	11	19	JAN 18,1975	
14.519	344.001	11	21	JAN 18,1975	
14.552	343.971	11	23	JAN 18,1975	
14.586	343.972	11	25	JAN 18,1975	
14.619	344.004	11	27	JAN 18,1975	
14.653	344.037	11	29	JAN 18,1975	

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14,686	344,038	11	31	JAN 18,1975	
14,719	344,071	11	33	JAN 18,1975	
14,753	344,040	11	35	JAN 18,1975	
14,786	344,073	11	37	JAN 18,1975	
14,819	344,074	11	39	JAN 18,1975	
14,853	344,012	11	41	JAN 18,1975	
14,886	344,013	11	43	JAN 18,1975	
14,920	344,045	11	45	JAN 18,1975	
14,953	344,046	11	47	JAN 18,1975	
14,986	344,047	11	49	JAN 18,1975	
15,020	344,048	11	51	JAN 18,1975	
15,053	344,018	11	53	JAN 18,1975	
15,086	344,050	11	55	JAN 18,1975	
15,120	343,988	11	57	JAN 18,1975	
15.153	344,053	11	59	JAN 18,1975	
15.187	343.990	12	01	JAN 18,1975	
15,220	344,055	12	03	JAN 18,1975	
15.253	344.056	12	05	JAN 18,1975	
15,287	344,057	12	07	JAN 18,1975	
15,320	344,026	12	09	JAN 18,1975	
15,353	344,027	12	11	JAN 18,1975	
15,387	343,965	12	13	JAN 18,1975	
15,420	343,966	12	15	JAN 18,1975	
15,454	343,999	12	17	JAN 18,1975	
15,487	344,031	12	19	JAN 18,1975	
15,520	343,969	12	21	JAN 18,1975	
15,554	343,970	12	23	JAN 18,1975	
15,587	343,971	12	25	JAN 18,1975	
15,620	343,972	12	27	JAN 18,1975	
15,654	343,942	12	29	JAN 18,1975	
15,687	343,911	12	31	JAN 18,1975	
15,721	343,944	12	33	JAN 18,1975	
15,754	343,977	12	35	JAN 18,1975	
15,787	343,946	12	37	JAN 18,1975	
15,821	343,947	12	39	JAN 18,1975	
15,854	343,948	12	41	JAN 18,1975	
15,887	343,949	12	43	JAN 18,1975	
15,921	343,919	12	45	JAN 18,1975	
15,954	343,920	12	47	JAN 18,1975	
15,988	343,952	12	49	JAN 18,1975	

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16,021	343,953	12	51	JAN 18,1975	
16,054	343,891	12	53	JAN 18,1975	
16,088	343,892	12	55	JAN 18,1975	
16,121	343,893	12	57	JAN 18,1975	
16,154	343,926	12	59	JAN 18,1975	
16,188	343,864	13	01	JAN 18,1975	
16,221	343,865	13	03	JAN 18,1975	
16,255	343.898	13	05	JAN 18,1975	
16,288	343,899	13	07	JAN 18,1975	
16,321	343,900	13	09	JAN 18,1975	
16,355	343,901	13	11	JAN 18,1975	
16,388	343,870	13	13	JAN 18,1975	
16,421	343,903	13	15	JAN 18,1975	
16,455	343,872	13	17	JAN 18,1975	
16,488	343.873	13	19	JAN 18,1975	
16,522	343.874	13	21	JAN 18,1975	
16,555	343,844	13	23	JAN 18,1975	
16.588	343.813	13	25	JAN 18,1975	
16,622	343.846	13	27	JAN 18,1975	
16,655	343,910	13	29	JAN 18,1975	
16,688	343,848	13	31	JAN 18,1975	
16,722	343,817	13	33	JAN 18,1975	
16,755	343,819	13	35	JAN 18,1975	
16,789	343,851	13	37	JAN 18,1975	
16,822	343,821	13	39	JAN 18,1975	
16,855	343,822	13	41	JAN 18,1975	
16,889	343,823	13	43	JAN 18,1975	
16,922	343,824	13	45	JAN 18,1975	
16,956	343,793	13	47	JAN 18,1975	
16,989	343,763	13	49	JAN 18,1975	
17,022	343,764	13	51	JAN 18,1975	
17,056	343.828	13	53	JAN 18,1975	
17,089	343,766	13	55	JAN 18,1975	
17,122	343,767	13	57	JAN 18,1975	
17,156	343,768	13	59	JAN 18,1975	
17,189	343,769	14	01	JAN 18,1975	
17,223	343,770	14	03	JAN 18,1975	
17,256	343,771	14	05	JAN 18,1975	
17,289	343,772	14	07	JAN 18,1975	
17,323	343,773	14	09	JAN 18,1975	

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DELTA TIME	PRESSURE (PSI)	TIME HR	TIME MIN	DATE	COMMENTS
17,356	343,932	14	11	JAN 18,1975	
17,389	343,807	14	13	JAN 18,1975	
17.423	343,776	14	15	JAN 18,1975	
17.456	343,714	14	17	JAN 18,1975	
17.490	343,715	14	19	JAN 18,1975	
17.523	343,685	14	21	JAN 18,1975	
17,556	343,654	14	23	JAN 18,1975	
17,590	343,655	14	25	JAN 18,1975	
17,623	343.625	14	27	JAN 18,1975	
17,656	343,594	14	29	JAN 18,1975	
17,690	343,595	14	31	JAN 18,1975	
17,723	343,596	14	33	JAN 18,1975	
17.757	343,566	14	35	JAN 18,1975	
17,790	343,472	14	37	JAN 18,1975	
17,823	343,536	14	39	JAN 18,1975	
17,857	343.537	14	41	JAN 18,1975	
17,890	343,507	14	43	JAN 18,1975	
17,923	343.413	14	45	JAN 18,1975	
17,957	343,414	14	47	JAN 18,1975	
17.990	343,447	14	49	JAN 18,1975	
18,024	343,416	14	51	JAN 18,1975	
18,057	343.417	14	53	JAN 18,1975	
18,090	343,355	14	55	JAN 18,1975	
18,124	343.419	14	57	JAN 18,1975	
18,157	343,389	14	59	JAN 18,1975	
18,190	343.327	15	01	JAN 18,1975	
18,224	343,360	15	03	JAN 18,1975	
18.257	343,361	15	05	JAN 18,1975	
18,291	343.362	15	07	JAN 18,1975	
18.324	343,300	15	09	JAN 18,1975	
18,357	343.301	15	11	JAN 18,1975	
18,391	343,333	15	13	JAN 18,1975	
18.424	343.303	15	15	JAN 18,1975	
18,457	343,241	15	17	JAN 18,1975	
18,491	343,273	15	19	JAN 18,1975	
18,524	343.274	15	21	JAN 18,1975	
18,558	343,275	15	23	JAN 18,1975	
18,591	343,213	15	25	JAN 18,1975	
18,624	343,246	15	27	JAN 18,1975	
18,658	343,247	15	29	JAN 18,1975	

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18,691	343,248	15	31	JAN 18,1975	
18,724	343,217	15	33	JAN 18,1975	
18,758	343,250	15	35	JAN 18,1975	
18,791	343,251	15	37	JAN 18,1975	
18,825	343,157	15	39	JAN 18,1975	
18,858	343,158	15	41	JAN 18,1975	
18,891	343.159	15	43	JAN 18,1975	
18,925	343.224	15	45	JAN 18,1975	
18,958	343.225	15	47	JAN 18,1975	
18,992	343,257	15	49	JAN 18,1975	
19,025	343,258	15	51	JAN 18,1975	
19.058	343,291	15	53	JAN 18,1975	
19,092	343.292	15	55	JAN 18,1975	
19,125	343.230	15	58	JAN 18,1975	
19.158	343.262	16	00	JAN 18,1975	
19.192	343,263	16	02	JAN 18,1975	
19.225	343,296	16	04	JAN 18,1975	
19,259	343.297	16	06	JAN 18,1975	
19,292	343,267	16	08	JAN 18,1975	
19,325	343.331	16	10	JAN 18,1975	
19,359	343,332	16	12	JAN 18,1975	
19,392	343,270	16	14	JAN 18,1975	
19,425	343,334	16	16	JAN 18,1975	
19,459	343,303	16	18	JAN 18,1975	
19,492	343,431	16	20	JAN 18,1975	
19,526	343.400	16	22	JAN 18,1975	
19,559	343.370	16	24	JAN 18,1975	
19,592	343,371	16	26	JAN 18,1975	
19.626	343.372	16	28	JAN 18,1975	
19,659	343,373	16	30	JAN 18,1975	
19,692	343,374	16	32	JAN 18,1975	
19,726	343.375	16	34	JAN 18,1975	
19,759	343,376	16	36	JAN 18,1975	
19,793	343.345	16	38	JAN 18,1975	
19,826	343.409	16	40	JAN 18,1975	
19,859	343,379	16	42	JAN 18,1975	
19,893	343.380	16	44	JAN 18,1975	
19,926	343,350	16	46	JAN 18,1975	
19,959	343,351	16	48	JAN 18,1975	
19,993	343,352	16	50	JAN 18,1975	

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		HR	MIN		
20,026	343,353	16	52	JAN 18,1975	
20,060	343,354	16	54	JAN 18,1975	
20,093	343.355	16	56	JAN 18,1975	
20,126	343.387	16	58	JAN 18,1975	
20,160	343,357	17	00	JAN 18,1975	
20,193	343,326	17	02	JAN 18,1975	
20,226	343.359	17	04	JAN 18,1975	
20,260	343.391	17	06	JAN 18,1975	
20,293	343.361	17	08	JAN 18,1975	
20,327	343,362	17	10	JAN 18,1975	
20,360	343.363	17	12	JAN 18,1975	
20,393	343,364	17	14	JAN 18,1975	
20,427	343,334	17	16	JAN 18,1975	
20,460	343,303	17	18	JAN 18,1975	
20,493	343.336	17	20	JAN 18,1975	
20.527	343.337	17	22	JAN 18,1975	
20.560	343.338	17	24	JAN 18,1975	
20.594	343.339	17	26	JAN 18,1975	
20,627	343.308	17	28	JAN 18,1975	
20,660	343.278	17	30	JAN 18,1975	
20.694	343,310	17	32	JAN 18,1975	
20,727	343,280	17	34	JAN 18,1975	
20,760	343.281	17	36	JAN 18,1975	
20,794	343.282	17	38	JAN 18,1975	
20.827	343,283	17	40	JAN 18,1975	
20,861	343,252	17	42	JAN 18,1975	
20,894	343.285	17	44	JAN 18,1975	
20,927	343.286	17	46	JAN 18,1975	
20.961	343.224	17	48	JAN 18,1975	
20,994	343.225	17	50	JAN 18,1975	
21,028	343,226	17	52	JAN 18,1975	
21,061	343,227	17	54	JAN 18,1975	
21,094	343.228	17	56	JAN 18,1975	
21,128	343.198	17	58	JAN 18,1975	
21.161	343,230	18	00	JAN 18,1975	
21,194	343,231	18	02	JAN 18,1975	
21,228	343,201	18	04	JAN 18,1975	
21,261	343,202	18	06	JAN 18,1975	
21,295	343,203	18	08	JAN 18,1975	
21,328	343,235	18	10	JAN 18,1975	

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21.361	343.205	18	12	JAN 18,1975	
21.395	343.174	18	14	JAN 18,1975	
21.428	343.144	18	16	JAN 18,1975	
21.461	343.145	18	18	JAN 18,1975	
21.495	343.146	18	20	JAN 18,1975	
21.528	343.116	18	22	JAN 18,1975	
21.562	343.117	18	24	JAN 18,1975	
21.595	343.118	18	26	JAN 18,1975	
21.628	343.119	18	28	JAN 18,1975	
21.662	343.088	18	30	JAN 18,1975	
21.695	343.089	18	32	JAN 18,1975	
21.728	343.090	18	34	JAN 18,1975	
21.762	343.091	18	36	JAN 18,1975	
21.795	343.029	18	38	JAN 18,1975	
21.829	343.062	18	40	JAN 18,1975	
21.862	343.031	18	42	JAN 18,1975	
21.895	343.064	18	44	JAN 18,1975	
21.929	343.002	18	46	JAN 18,1975	
21.962	343.003	18	48	JAN 18,1975	
21.995	343.004	18	50	JAN 18,1975	
22.029	343.005	18	52	JAN 18,1975	
22.062	342.974	18	54	JAN 18,1975	
22.096	342.975	18	56	JAN 18,1975	
22.129	342.976	18	58	JAN 18,1975	
22.162	342.946	19	00	JAN 18,1975	
22.196	342.915	19	02	JAN 18,1975	
22.229	342.917	19	04	JAN 18,1975	
22.262	342.886	19	06	JAN 18,1975	
22.296	342.887	19	08	JAN 18,1975	
22.329	342.888	19	10	JAN 18,1975	
22.363	342.889	19	12	JAN 18,1975	
22.396	342.859	19	14	JAN 18,1975	
22.429	342.860	19	16	JAN 18,1975	
22.463	342.829	19	18	JAN 18,1975	
22.496	342.799	19	20	JAN 18,1975	
22.529	342.831	19	22	JAN 18,1975	
22.563	342.832	19	24	JAN 18,1975	
22.596	342.770	19	26	JAN 18,1975	
22.630	342.771	19	28	JAN 18,1975	
22.663	342.772	19	30	JAN 18,1975	

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22,696	342,773	19	32	JAN 18,1975	
22,730	342,711	19	34	JAN 18,1975	
22,763	342,681	19	36	JAN 18,1975	
22,796	342,745	19	38	JAN 18,1975	
22,830	342,714	19	40	JAN 18,1975	
22,863	342,684	19	42	JAN 18,1975	
22,897	342.622	19	44	JAN 18,1975	
22,930	342,686	19	46	JAN 18,1975	
22,963	342,687	19	48	JAN 18,1975	
22,997	342,688	19	50	JAN 18,1975	
23,030	342.689	19	52	JAN 18,1975	
23,064	342.722	19	54	JAN 18,1975	
23,097	342,691	19	56	JAN 18,1975	
23,130	342.724	19	58	JAN 18,1975	
23,164	342,693	20	00	JAN 18,1975	
23,197	342.694	20	02	JAN 18,1975	
23.230	342.695	20	04	JAN 18,1975	
23,264	342,665	20	06	JAN 18,1975	
23.297	342,666	20	08	JAN 18,1975	
23,331	342.667	20	10	JAN 18,1975	
23,364	342.668	20	12	JAN 18,1975	
23,397	342.669	20	14	JAN 18,1975	
23,431	342,638	20	16	JAN 18,1975	
23,464	342,640	20	18	JAN 18,1975	
23,497	342.641	20	20	JAN 18,1975	
23,531	342,673	20	22	JAN 18,1975	
23,564	342.674	20	24	JAN 18,1975	
23,598	343,085	20	26	JAN 18,1975	
23,631	342,834	20	28	JAN 18,1975	
23,664	342.709	20	30	JAN 18,1975	
23,698	342,710	20	32	JAN 18,1975	
23,731	342,711	20	34	JAN 18,1975	
23,764	342,680	20	36	JAN 18,1975	
23,798	342,681	20	38	JAN 18,1975	
23,831	342,683	20	40	JAN 18,1975	
23,865	342,684	20	42	JAN 18,1975	
23,898	342,685	20	44	JAN 18,1975	
23,931	342,686	20	46	JAN 18,1975	
23,965	342,624	20	48	JAN 18,1975	END JETTING
23,998	342,656	20	50	JAN 18,1975	START RECOVERY

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DELTA TIME	PRESSURE (PSI)	TIME HR	MIN	DATE	COMMENTS
24.031	342.657	20	52	JAN 18,1975	
24.065	342.658	20	54	JAN 18,1975	
24.098	342.628	20	56	JAN 18,1975	
24.132	342.629	20	58	JAN 18,1975	
24.165	342.598	21	00	JAN 18,1975	
24.198	343.230	21	02	JAN 18,1975	
24.232	344.430	21	04	JAN 18,1975	
24.265	345.157	21	06	JAN 18,1975	
24.298	345.758	21	08	JAN 18,1975	
24.332	346.169	21	10	JAN 18,1975	
24.365	346.643	21	12	JAN 18,1975	
24.399	346.991	21	14	JAN 18,1975	
24.432	347.276	21	16	JAN 18,1975	
24.465	347.498	21	18	JAN 18,1975	
24.499	347.815	21	20	JAN 18,1975	
24.532	348.100	21	22	JAN 18,1975	
24.565	348.259	21	24	JAN 18,1975	
24.599	348.512	21	26	JAN 18,1975	
24.632	348.702	21	28	JAN 18,1975	
24.666	348.830	21	30	JAN 18,1975	
24.699	349.052	21	32	JAN 18,1975	
24.732	349.147	21	34	JAN 18,1975	
24.766	349.338	21	36	JAN 18,1975	
24.799	349.528	21	38	JAN 18,1975	
24.832	349.655	21	40	JAN 18,1975	
24.866	349.751	21	42	JAN 18,1975	
24.899	349.910	21	44	JAN 18,1975	
24.933	350.069	21	46	JAN 18,1975	
24.966	350.196	21	48	JAN 18,1975	
24.999	350.291	21	50	JAN 18,1975	
25.033	350.356	21	52	JAN 18,1975	
25.066	350.514	21	54	JAN 18,1975	
25.100	350.642	21	56	JAN 18,1975	
25.133	350.706	21	58	JAN 18,1975	
25.166	350.802	22	00	JAN 18,1975	END OF TEST

755 POINTS REPORTED THIS RUN

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PRECISION SUBSURFACE PRESSURE GAUGE REPORT

PREPARED FOR

ATLANTIC RICHFIELD COMPANY

WELL NUMBER	SORGHUM GULCH NO.1
FIELD/LEASE	SORGHUM GULCH TRACT CB
COUNTY/PARISH	RIO BLANCO
STATE	COLORADO
TYPE OF TEST	MULTI-PACKER DRILL STEM
REFERENCE ELEV	GROUND LEVEL

ADDITIONAL INFORMATICN

GAUGE NO. 222 RAN WITH 1400 LBS. ELEMENT INSIDE

DRILL PIPE.

GAUGE DEPTH WAS AT 958 FT AND PACKER WAS SET AT

944 FT. (BOTTOM PACKER)

INITIAL HYDROSTATIC PRESSURE WAS 373.18 PSI

FINAL HYDROSTATIC PRESSURE WAS 371.41 PSI

GROUND LEVEL REFERENCE IS 6426 FT. APP.

THE TEST INTERVAL WAS FROM 944 FT. TO 2522 FT. T.D.

JETTING WAS DONE ON SG 1A WHICH IS 100 FT (SURFACE)

AWAY FROM S.G.1

773 POINTS REPORTED THIS JOB

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0.000	381.032	20	50	JAN 17,1975	ON BOTTOM
.033	381.198	20	52	JAN 17,1975	
.065	381.298	20	54	JAN 17,1975	
.098	381.432	20	56	JAN 17,1975	
.130	381.498	20	58	JAN 17,1975	
.163	381.565	21	00	JAN 17,1975	START JETTING
.196	381.565	21	02	JAN 17,1975	IN SG-1A
.228	381.632	21	04	JAN 17,1975	
.261	381.798	21	06	JAN 17,1975	
.293	381.798	21	08	JAN 17,1975	
.326	381.832	21	10	JAN 17,1975	
.359	381.865	21	12	JAN 17,1975	
.391	381.965	21	13	JAN 17,1975	
.424	381.998	21	15	JAN 17,1975	
.456	381.932	21	17	JAN 17,1975	
.489	382.032	21	19	JAN 17,1975	
.522	382.098	21	21	JAN 17,1975	
.554	382.098	21	23	JAN 17,1975	
.587	382.098	21	25	JAN 17,1975	
.619	382.098	21	27	JAN 17,1975	
.652	382.165	21	29	JAN 17,1975	
.685	382.132	21	31	JAN 17,1975	
.717	382.165	21	33	JAN 17,1975	
.750	382.198	21	35	JAN 17,1975	
.782	382.198	21	37	JAN 17,1975	
.815	382.198	21	39	JAN 17,1975	
.848	382.265	21	41	JAN 17,1975	
.880	382.298	21	43	JAN 17,1975	
.913	382.332	21	45	JAN 17,1975	
.945	382.298	21	47	JAN 17,1975	
.978	382.298	21	49	JAN 17,1975	
1.011	382.298	21	51	JAN 17,1975	
1.043	382.365	21	53	JAN 17,1975	
1.076	382.365	21	55	JAN 17,1975	
1.108	382.365	21	57	JAN 17,1975	
1.141	382.332	21	58	JAN 17,1975	
1.174	382.332	22	00	JAN 17,1975	
1.206	382.398	22	02	JAN 17,1975	
1.239	382.365	22	04	JAN 17,1975	
1.271	382.398	22	06	JAN 17,1975	

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1.304	382.432	22	08	JAN 17,1975	
1.337	382.398	22	10	JAN 17,1975	
1.369	382.398	22	12	JAN 17,1975	
1.402	382.465	22	14	JAN 17,1975	
1.434	382.465	22	16	JAN 17,1975	
1.467	382.398	22	18	JAN 17,1975	
1.500	382.432	22	20	JAN 17,1975	
1.532	382.432	22	22	JAN 17,1975	
1.565	382.465	22	24	JAN 17,1975	
1.597	382.498	22	26	JAN 17,1975	
1.630	382.398	22	28	JAN 17,1975	
1.663	382.432	22	30	JAN 17,1975	
1.695	382.498	22	32	JAN 17,1975	
1.728	382.498	22	34	JAN 17,1975	
1.760	382.532	22	36	JAN 17,1975	
1.793	382.498	22	38	JAN 17,1975	
1.826	382.465	22	40	JAN 17,1975	
1.858	382.532	22	41	JAN 17,1975	
1.891	382.532	22	43	JAN 17,1975	
1.923	382.498	22	45	JAN 17,1975	
1.956	382.565	22	47	JAN 17,1975	
1.989	382.532	22	49	JAN 17,1975	
2.021	382.498	22	51	JAN 17,1975	
2.054	382.565	22	53	JAN 17,1975	
2.086	382.565	22	55	JAN 17,1975	
2.119	382.532	22	57	JAN 17,1975	
2.152	382.532	22	59	JAN 17,1975	
2.184	382.532	23	01	JAN 17,1975	
2.217	382.565	23	03	JAN 17,1975	
2.249	382.599	23	05	JAN 17,1975	
2.282	382.565	23	07	JAN 17,1975	
2.315	382.532	23	09	JAN 17,1975	
2.347	382.565	23	11	JAN 17,1975	
2.380	382.599	23	13	JAN 17,1975	
2.412	382.599	23	15	JAN 17,1975	
2.445	382.632	23	17	JAN 17,1975	
2.478	382.632	23	19	JAN 17,1975	
2.510	382.632	23	21	JAN 17,1975	
2.543	382.599	23	23	JAN 17,1975	
2.575	382.565	23	25	JAN 17,1975	

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DELTA TIME	PRESSURE (PSI)	TIME HR	MIN	DATE	COMMENTS
2,608	382,665	23	26	JAN 17,1975	
2,641	382,599	23	28	JAN 17,1975	
2,673	382.599	23	30	JAN 17,1975	
2,706	382,599	23	32	JAN 17,1975	
2.738	382,665	23	34	JAN 17,1975	
2,771	382,699	23	36	JAN 17,1975	
2,804	382,632	23	38	JAN 17,1975	
2,836	382,599	23	40	JAN 17,1975	
2,869	382,665	23	42	JAN 17,1975	
2,901	382,665	23	44	JAN 17,1975	
2,934	382.665	23	46	JAN 17,1975	
2,967	382.532	23	48	JAN 17,1975	
2,999	382.665	23	50	JAN 17,1975	
3,032	382.599	23	52	JAN 17,1975	
3,064	382,599	23	54	JAN 17,1975	
3,097	382,599	23	56	JAN 17,1975	
3,130	382,665	23	58	JAN 17,1975	
3,162	382.632	00	00	JAN 18,1975	
3,195	382,632	00	02	JAN 18,1975	
3,227	382.632	00	04	JAN 18,1975	
3,260	382,699	00	06	JAN 18,1975	
3,292	382,665	00	08	JAN 18,1975	
3,325	382.665	00	10	JAN 18,1975	
3,358	382.665	00	11	JAN 18,1975	
3,390	382,732	00	13	JAN 18,1975	
3,423	382,632	00	15	JAN 18,1975	
3,455	382.599	00	17	JAN 18,1975	
3,488	382.632	00	19	JAN 18,1975	
3,521	382.732	00	21	JAN 18,1975	
3,553	382,699	00	23	JAN 18,1975	
3,586	382.699	00	25	JAN 18,1975	
3,618	382,699	00	27	JAN 18,1975	
3,651	382.732	00	29	JAN 18,1975	
3,684	382.732	00	31	JAN 18,1975	
3,716	382,665	00	33	JAN 18,1975	
3,749	382,699	00	35	JAN 18,1975	
3,781	382.799	00	37	JAN 18,1975	
3.814	382,665	00	39	JAN 18,1975	
3,847	382.765	00	41	JAN 18,1975	
3,879	382,732	00	43	JAN 18,1975	

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3.912	382.732	00	45	JAN 18,1975	
3.944	382.732	00	47	JAN 18,1975	
3.977	382.732	00	49	JAN 18,1975	
4.010	382.665	00	51	JAN 18,1975	
4.042	382.765	00	53	JAN 18,1975	
4.075	382.799	00	54	JAN 18,1975	
4.107	382.799	00	56	JAN 18,1975	
4.140	382.699	00	58	JAN 18,1975	
4.173	382.732	01	00	JAN 18,1975	
4.205	382.799	01	02	JAN 18,1975	
4.238	382.799	01	04	JAN 18,1975	
4.270	382.732	01	06	JAN 18,1975	
4.303	382.765	01	08	JAN 18,1975	
4.336	382.765	01	10	JAN 18,1975	
4.368	382.765	01	12	JAN 18,1975	
4.401	382.765	01	14	JAN 18,1975	
4.433	382.865	01	16	JAN 18,1975	
4.466	382.765	01	18	JAN 18,1975	
4.499	382.799	01	20	JAN 18,1975	
4.531	382.699	01	22	JAN 18,1975	
4.564	382.765	01	24	JAN 18,1975	
4.596	382.799	01	26	JAN 18,1975	
4.629	382.765	01	28	JAN 18,1975	
4.662	382.699	01	30	JAN 18,1975	
4.694	382.732	01	32	JAN 18,1975	
4.727	382.732	01	34	JAN 18,1975	
4.759	382.799	01	36	JAN 18,1975	
4.792	382.765	01	38	JAN 18,1975	
4.825	382.765	01	39	JAN 18,1975	
4.857	382.765	01	41	JAN 18,1975	
4.890	382.732	01	43	JAN 18,1975	
4.922	382.765	01	45	JAN 18,1975	
4.955	382.832	01	47	JAN 18,1975	
4.988	382.765	01	49	JAN 18,1975	
5.020	382.765	01	51	JAN 18,1975	
5.053	382.732	01	53	JAN 18,1975	
5.085	382.599	01	55	JAN 18,1975	
5.118	382.665	01	57	JAN 18,1975	
5.151	382.699	01	59	JAN 18,1975	
5.183	382.699	02	01	JAN 18,1975	

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5.216	382.765	02	03	JAN 18,1975	
5.248	382.799	02	05	JAN 18,1975	
5.281	382.632	02	07	JAN 18,1975	
5.314	382.699	02	09	JAN 18,1975	
5.346	382.699	02	11	JAN 18,1975	
5.379	382.765	02	13	JAN 18,1975	
5.411	382.699	02	15	JAN 18,1975	
5.444	382.665	02	17	JAN 18,1975	
5.477	382.799	02	19	JAN 18,1975	
5.509	382.799	02	21	JAN 18,1975	
5.542	382.732	02	23	JAN 18,1975	
5.574	382.699	02	24	JAN 18,1975	
5.607	382.765	02	26	JAN 18,1975	
5.640	382.799	02	28	JAN 18,1975	
5.672	382.732	02	30	JAN 18,1975	
5.705	382.799	02	32	JAN 18,1975	
5.737	382.799	02	34	JAN 18,1975	
5.770	382.732	02	36	JAN 18,1975	
5.803	382.732	02	38	JAN 18,1975	
5.835	382.732	02	40	JAN 18,1975	
5.868	382.732	02	42	JAN 18,1975	
5.900	382.665	02	44	JAN 18,1975	
5.933	382.699	02	46	JAN 18,1975	
5.966	382.699	02	48	JAN 18,1975	
5.998	382.732	02	50	JAN 18,1975	
6.031	382.732	02	52	JAN 18,1975	
6.063	382.699	02	54	JAN 18,1975	
6.096	382.665	02	56	JAN 18,1975	
6.129	382.732	02	58	JAN 18,1975	
6.161	382.765	03	00	JAN 18,1975	
6.194	382.665	03	02	JAN 18,1975	
6.226	382.732	03	04	JAN 18,1975	
6.259	382.699	03	06	JAN 18,1975	
6.292	382.732	03	07	JAN 18,1975	
6.324	382.765	03	09	JAN 18,1975	
6.357	382.699	03	11	JAN 18,1975	
6.389	382.765	03	13	JAN 18,1975	
6.422	382.632	03	15	JAN 18,1975	
6.455	382.699	03	17	JAN 18,1975	
6.487	382.632	03	19	JAN 18,1975	

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6,520	382,665	03	21	JAN 18,1975	
6,552	382,699	03	23	JAN 18,1975	
6,585	382,665	03	25	JAN 18,1975	
6,618	382,699	03	27	JAN 18,1975	
6,650	382,699	03	29	JAN 18,1975	
6,683	382,665	03	31	JAN 18,1975	
6,715	382.665	03	33	JAN 18,1975	
6,748	382.632	03	35	JAN 18,1975	
6,781	382,699	03	37	JAN 18,1975	
6,813	382,699	03	39	JAN 18,1975	
6,846	382.632	03	41	JAN 18,1975	
6,878	382,599	03	43	JAN 18,1975	
6.911	382.665	03	45	JAN 18,1975	
6.944	382.665	03	47	JAN 18,1975	
6,976	382.665	03	49	JAN 18,1975	
7.009	382.665	03	51	JAN 18,1975	
7.041	382,632	03	52	JAN 18,1975	
7,074	382.532	03	54	JAN 18,1975	
7,107	382.599	03	56	JAN 18,1975	
7,139	382.432	03	58	JAN 18,1975	
7,172	382.632	04	00	JAN 18,1975	
7,204	382,632	04	02	JAN 18,1975	
7.237	382,599	04	04	JAN 18,1975	
7,270	382.498	04	06	JAN 18,1975	
7,302	382,532	04	08	JAN 18,1975	
7,335	382.665	04	10	JAN 18,1975	
7.367	382.665	04	12	JAN 18,1975	
7.400	382,632	04	14	JAN 18,1975	
7,433	382.599	04	16	JAN 18,1975	
7.465	382.632	04	18	JAN 18,1975	
7,498	382.632	04	20	JAN 18,1975	
7,530	382,632	04	22	JAN 18,1975	
7,563	382.632	04	24	JAN 18,1975	
7,596	382,599	04	26	JAN 18,1975	
7,628	382.632	04	28	JAN 18,1975	
7,661	382,632	04	30	JAN 18,1975	
7.693	382,665	04	32	JAN 18,1975	
7,726	382.699	04	34	JAN 18,1975	
7,759	382.599	04	36	JAN 18,1975	
7,791	382,565	04	37	JAN 18,1975	

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7,824	382,665	04	39	JAN 18,1975	
7,856	382,632	04	41	JAN 18,1975	
7,889	382,599	04	43	JAN 18,1975	
7,922	382,599	04	45	JAN 18,1975	
7,954	382,665	04	47	JAN 18,1975	
7.987	382,665	04	49	JAN 18,1975	
8,019	382,599	04	51	JAN 18,1975	
8,052	382.565	04	53	JAN 18,1975	
8,085	382,665	04	55	JAN 18,1975	
8,117	382.699	04	57	JAN 18,1975	
8,150	382,632	04	59	JAN 18,1975	
8,182	382,599	05	01	JAN 18,1975	
8,215	382.699	05	03	JAN 18,1975	
8,248	382.699	05	05	JAN 18,1975	
8,280	382.665	05	07	JAN 18,1975	
8,313	382.532	05	09	JAN 18,1975	
8,345	382,632	05	11	JAN 18,1975	
8.378	382,699	05	13	JAN 18,1975	
8,411	382.665	05	15	JAN 18,1975	
8,443	382,632	05	17	JAN 18,1975	
8,476	382,699	05	19	JAN 18,1975	
8,508	382,665	05	21	JAN 18,1975	
8,541	382,599	05	22	JAN 18,1975	
8,574	382,632	05	24	JAN 18,1975	
8,606	382,632	05	26	JAN 18,1975	
8,639	382.765	05	28	JAN 18,1975	
8.671	382,665	05	30	JAN 18,1975	
8,704	382.665	05	32	JAN 18,1975	
8,737	382,699	05	34	JAN 18,1975	
8,769	382,665	05	36	JAN 18,1975	
8,802	382,665	05	38	JAN 18,1975	
8,834	382,599	05	40	JAN 18,1975	
8,867	382.665	05	42	JAN 18,1975	
8,900	382,665	05	44	JAN 18,1975	
8,932	382,632	05	46	JAN 18,1975	
8,965	382.632	05	48	JAN 18,1975	
8,997	382,632	05	50	JAN 18,1975	
9,030	382,632	05	52	JAN 18,1975	
9,063	382.599	05	54	JAN 18,1975	
9,095	382,498	05	56	JAN 18,1975	

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9,128	382,599	05	58	JAN 18,1975	
9,160	382.665	06	00	JAN 18,1975	
9.193	382,665	06	02	JAN 18,1975	
9,226	382.599	06	04	JAN 18,1975	
9,258	382,665	06	05	JAN 18,1975	
9,291	382,599	06	07	JAN 18,1975	
9,323	382,632	06	09	JAN 18,1975	
9.356	382,565	06	11	JAN 18,1975	
9,389	382.632	06	13	JAN 18,1975	
9,421	382,665	06	15	JAN 18,1975	
9,454	382,599	06	17	JAN 18,1975	
9,486	382,599	06	19	JAN 18,1975	
9,519	382.665	06	21	JAN 18,1975	
9,552	382.632	06	23	JAN 18,1975	
9,584	382.599	06	25	JAN 18,1975	
9,617	382,599	06	27	JAN 18,1975	
9,649	382.632	06	29	JAN 18,1975	
9.682	382.632	06	31	JAN 18,1975	
9.715	382,632	06	33	JAN 18,1975	
9,747	382.632	06	35	JAN 18,1975	
9,780	382,632	06	37	JAN 18,1975	
9.812	382,632	06	39	JAN 18,1975	
9,845	382.599	06	41	JAN 18,1975	
9,877	382,599	06	43	JAN 18,1975	
9,910	382.632	06	45	JAN 18,1975	
9,943	382.632	06	47	JAN 18,1975	
9,975	382,599	06	49	JAN 18,1975	
10,008	382.632	06	50	JAN 18,1975	
10,040	382.599	06	52	JAN 18,1975	
10,073	382,599	06	54	JAN 18,1975	
10,106	382.632	06	56	JAN 18,1975	
10,138	382,565	06	58	JAN 18,1975	
10.171	382,632	07	00	JAN 18,1975	
10,203	382,599	07	02	JAN 18,1975	
10,236	382.599	07	04	JAN 18,1975	
10.269	382.599	07	06	JAN 18,1975	
10,301	382,632	07	08	JAN 18,1975	
10,334	382.632	07	10	JAN 18,1975	
10,366	382,565	07	12	JAN 18,1975	
10,399	382,565	07	14	JAN 18,1975	

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10.432	382.565	07	16	JAN 18,1975	
10.464	382.465	07	18	JAN 18,1975	
10.497	382.532	07	20	JAN 18,1975	
10.529	382.565	07	22	JAN 18,1975	
10.562	382.632	07	24	JAN 18,1975	
10.595	382.599	07	26	JAN 18,1975	
10.627	382.599	07	28	JAN 18,1975	
10.660	382.532	07	30	JAN 18,1975	
10.692	382.565	07	32	JAN 18,1975	
10.725	382.632	07	34	JAN 18,1975	
10.758	382.565	07	35	JAN 18,1975	
10.790	382.532	07	37	JAN 18,1975	
10.823	382.565	07	39	JAN 18,1975	
10.855	382.532	07	41	JAN 18,1975	
10.888	382.498	07	43	JAN 18,1975	
10.921	382.498	07	45	JAN 18,1975	
10.953	382.565	07	47	JAN 18,1975	
10.986	382.565	07	49	JAN 18,1975	
11.018	382.365	07	51	JAN 18,1975	
11.051	382.465	07	53	JAN 18,1975	
11.084	382.532	07	55	JAN 18,1975	
11.116	382.565	07	57	JAN 18,1975	
11.149	382.465	07	59	JAN 18,1975	
11.181	382.498	08	01	JAN 18,1975	
11.214	382.498	08	03	JAN 18,1975	
11.247	382.532	08	05	JAN 18,1975	
11.279	382.432	08	07	JAN 18,1975	
11.312	382.465	08	09	JAN 18,1975	
11.344	382.498	08	11	JAN 18,1975	
11.377	382.498	08	13	JAN 18,1975	
11.410	382.465	08	15	JAN 18,1975	
11.442	382.498	08	17	JAN 18,1975	
11.475	382.498	08	18	JAN 18,1975	
11.507	382.498	08	20	JAN 18,1975	
11.540	382.398	08	22	JAN 18,1975	
11.573	382.432	08	24	JAN 18,1975	
11.605	382.432	08	26	JAN 18,1975	
11.638	382.432	08	28	JAN 18,1975	
11.670	382.432	08	30	JAN 18,1975	
11.703	382.432	08	32	JAN 18,1975	

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11.736	382.498	08	34	JAN 18,1975	
11.768	382.498	08	36	JAN 18,1975	
11.801	382.465	08	38	JAN 18,1975	
11.833	382.465	08	40	JAN 18,1975	
11.866	382.498	08	42	JAN 18,1975	
11.899	382.498	08	44	JAN 18,1975	
11.931	382.498	08	46	JAN 18,1975	
11.964	382.432	08	48	JAN 18,1975	
11.996	382.498	08	50	JAN 18,1975	
12.029	382.565	08	52	JAN 18,1975	
12.062	382.465	08	54	JAN 18,1975	
12.094	382.465	08	56	JAN 18,1975	
12.127	382.465	08	58	JAN 18,1975	
12.159	382.498	09	00	JAN 18,1975	
12.192	382.265	09	02	JAN 18,1975	
12.225	382.398	09	03	JAN 18,1975	
12.257	382.465	09	05	JAN 18,1975	
12.290	382.298	09	07	JAN 18,1975	
12.322	382.432	09	09	JAN 18,1975	
12.355	382.432	09	11	JAN 18,1975	
12.388	382.398	09	13	JAN 18,1975	
12.420	382.498	09	15	JAN 18,1975	
12.453	382.432	09	17	JAN 18,1975	
12.485	382.432	09	19	JAN 18,1975	
12.518	382.432	09	21	JAN 18,1975	
12.551	382.432	09	23	JAN 18,1975	
12.583	382.365	09	25	JAN 18,1975	
12.616	382.365	09	27	JAN 18,1975	
12.648	382.465	09	29	JAN 18,1975	
12.681	382.465	09	31	JAN 18,1975	
12.714	382.432	09	33	JAN 18,1975	
12.746	382.365	09	35	JAN 18,1975	
12.779	382.465	09	37	JAN 18,1975	
12.811	382.465	09	39	JAN 18,1975	
12.844	382.365	09	41	JAN 18,1975	
12.877	382.298	09	43	JAN 18,1975	
12.909	382.398	09	45	JAN 18,1975	
12.942	382.365	09	47	JAN 18,1975	
12.974	382.365	09	48	JAN 18,1975	
13.007	382.365	09	50	JAN 18,1975	

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13.040	382.365	09	52	JAN 18,1975	
13.072	382.398	09	54	JAN 18,1975	
13.105	382.298	09	56	JAN 18,1975	
13.137	382.332	09	58	JAN 18,1975	
13.170	382.332	10	00	JAN 18,1975	
13.203	382.398	10	02	JAN 18,1975	
13.235	382.298	10	04	JAN 18,1975	
13.268	382.298	10	06	JAN 18,1975	
13.300	382.298	10	08	JAN 18,1975	
13.333	382.365	10	10	JAN 18,1975	
13.366	382.298	10	12	JAN 18,1975	
13.398	382.298	10	14	JAN 18,1975	
13.431	382.365	10	16	JAN 18,1975	
13.463	382.332	10	18	JAN 18,1975	
13.496	382.298	10	20	JAN 18,1975	
13.529	382.332	10	22	JAN 18,1975	
13.561	382.332	10	24	JAN 18,1975	
13.594	382.298	10	26	JAN 18,1975	
13.626	382.265	10	28	JAN 18,1975	
13.659	382.298	10	30	JAN 18,1975	
13.692	382.332	10	31	JAN 18,1975	
13.724	382.298	10	33	JAN 18,1975	
13.757	382.332	10	35	JAN 18,1975	
13.789	382.265	10	37	JAN 18,1975	
13.822	382.332	10	39	JAN 18,1975	
13.855	382.298	10	41	JAN 18,1975	
13.887	382.265	10	43	JAN 18,1975	
13.920	382.265	10	45	JAN 18,1975	
13.952	382.298	10	47	JAN 18,1975	
13.985	382.165	10	49	JAN 18,1975	
14.018	382.265	10	51	JAN 18,1975	
14.050	382.198	10	53	JAN 18,1975	
14.083	382.198	10	55	JAN 18,1975	
14.115	382.332	10	57	JAN 18,1975	
14.148	382.298	10	59	JAN 18,1975	
14.181	382.298	11	01	JAN 18,1975	
14.213	382.298	11	03	JAN 18,1975	
14.246	382.332	11	05	JAN 18,1975	
14.278	382.265	11	07	JAN 18,1975	
14.311	382.232	11	09	JAN 18,1975	

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14,344	382,265	11	11	JAN 18,1975	
14,376	382,265	11	13	JAN 18,1975	
14,409	382.165	11	15	JAN 18,1975	
14,441	382.198	11	16	JAN 18,1975	
14,474	382,298	11	18	JAN 18,1975	
14,507	382,298	11	20	JAN 18,1975	
14,539	382,265	11	22	JAN 18,1975	
14,572	382,232	11	24	JAN 18,1975	
14,604	382.165	11	26	JAN 18,1975	
14,637	382.098	11	28	JAN 18,1975	
14,670	382,198	11	30	JAN 18,1975	
14,702	382.198	11	32	JAN 18,1975	
14,735	382.232	11	34	JAN 18,1975	
14,767	382.298	11	36	JAN 18,1975	
14.800	382.165	11	38	JAN 18,1975	
14,833	382.232	11	40	JAN 18,1975	
14.865	382.232	11	42	JAN 18,1975	
14.898	382,265	11	44	JAN 18,1975	
14.930	382.232	11	46	JAN 18,1975	
14,963	382,232	11	48	JAN 18,1975	
14,996	382.265	11	50	JAN 18,1975	
15,028	382.298	11	52	JAN 18,1975	
15,061	382.232	11	54	JAN 18,1975	
15,093	382.098	11	56	JAN 18,1975	
15,126	382.232	11	58	JAN 18,1975	
15.159	382.232	12	00	JAN 18,1975	
15,191	382,198	12	01	JAN 18,1975	
15,224	382,265	12	03	JAN 18,1975	
15,256	382.298	12	05	JAN 18,1975	
15,289	382,265	12	07	JAN 18,1975	
15.322	382.232	12	09	JAN 18,1975	
15,354	382.265	12	11	JAN 18,1975	
15,387	382.298	12	13	JAN 18,1975	
15,419	382,265	12	15	JAN 18,1975	
15,452	382,232	12	17	JAN 18,1975	
15,485	382.232	12	19	JAN 18,1975	
15,517	382.265	12	21	JAN 18,1975	
15,550	382.265	12	23	JAN 18,1975	
15.582	382.165	12	25	JAN 18,1975	
15,615	382,198	12	27	JAN 18,1975	

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15.648	382.232	12	29	JAN 18,1975	
15.680	382.198	12	31	JAN 18,1975	
15.713	382.198	12	33	JAN 18,1975	
15.745	382.232	12	35	JAN 18,1975	
15.778	382.265	12	37	JAN 18,1975	
15.811	382.165	12	39	JAN 18,1975	
15.843	382.298	12	41	JAN 18,1975	
15.876	382.265	12	43	JAN 18,1975	
15.908	382.065	12	44	JAN 18,1975	
15.941	382.298	12	46	JAN 18,1975	
15.974	382.232	12	48	JAN 18,1975	
16.006	382.198	12	50	JAN 18,1975	
16.039	382.198	12	52	JAN 18,1975	
16.071	382.232	12	54	JAN 18,1975	
16.104	382.198	12	56	JAN 18,1975	
16.137	382.098	12	58	JAN 18,1975	
16.169	382.198	13	00	JAN 18,1975	
16.202	382.065	13	02	JAN 18,1975	
16.234	382.198	13	04	JAN 18,1975	
16.267	382.065	13	06	JAN 18,1975	
16.299	382.132	13	08	JAN 18,1975	
16.332	382.198	13	10	JAN 18,1975	
16.365	382.198	13	12	JAN 18,1975	
16.397	382.198	13	14	JAN 18,1975	
16.430	382.198	13	16	JAN 18,1975	
16.462	382.198	13	18	JAN 18,1975	
16.495	382.198	13	20	JAN 18,1975	
16.528	381.998	13	22	JAN 18,1975	
16.560	382.232	13	24	JAN 18,1975	
16.593	382.198	13	26	JAN 18,1975	
16.625	382.198	13	28	JAN 18,1975	
16.658	382.165	13	29	JAN 18,1975	
16.691	382.198	13	31	JAN 18,1975	
16.723	382.232	13	33	JAN 18,1975	
16.756	382.165	13	35	JAN 18,1975	
16.788	382.165	13	37	JAN 18,1975	
16.821	382.232	13	39	JAN 18,1975	
16.854	382.198	13	41	JAN 18,1975	
16.886	382.165	13	43	JAN 18,1975	
16.919	382.165	13	45	JAN 18,1975	

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16,951	382,165	13	47	JAN 18,1975	
16,984	382,165	13	49	JAN 18,1975	
17,017	382.165	13	51	JAN 18,1975	
17,049	382,165	13	53	JAN 18,1975	
17.082	382,165	13	55	JAN 18,1975	
17,114	382,132	13	57	JAN 18,1975	
17.147	382,132	13	59	JAN 18,1975	
17.180	382,165	14	01	JAN 18,1975	
17,212	382.132	14	03	JAN 18,1975	
17,245	382.132	14	05	JAN 18,1975	
17,277	381.998	14	07	JAN 18,1975	
17,310	382,132	14	09	JAN 18,1975	
17.343	382.132	14	11	JAN 18,1975	
17,375	382,098	14	13	JAN 18,1975	
17,408	382,132	14	14	JAN 18,1975	
17,440	382,132	14	16	JAN 18,1975	
17.473	382.165	14	18	JAN 18,1975	
17,506	382.132	14	20	JAN 18,1975	
17,538	382,132	14	22	JAN 18,1975	
17,571	382,132	14	24	JAN 18,1975	
17,603	382.165	14	26	JAN 18,1975	
17,636	382,132	14	28	JAN 18,1975	
17,669	382,098	14	30	JAN 18,1975	
17,701	382.132	14	32	JAN 18,1975	
17,734	382.132	14	34	JAN 18,1975	
17,766	382,132	14	36	JAN 18,1975	
17,799	382,065	14	38	JAN 18,1975	
17.832	382.098	14	40	JAN 18,1975	
17,864	382,132	14	42	JAN 18,1975	
17,897	382.132	14	44	JAN 18,1975	
17,929	382.098	14	46	JAN 18,1975	
17,962	382,132	14	48	JAN 18,1975	
17,995	382,132	14	50	JAN 18,1975	
18,027	382.098	14	52	JAN 18,1975	
18,060	382.098	14	54	JAN 18,1975	
18,092	382.098	14	56	JAN 18,1975	
18,125	382.132	14	58	JAN 18,1975	
18.158	382.098	14	59	JAN 18,1975	
18,190	382.098	15	01	JAN 18,1975	
18,223	382,132	15	03	JAN 18,1975	

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TIME	(PSI)	HR	MIN		
18.255	382.165	15	05	JAN 18,1975	
18.288	382.098	15	07	JAN 18,1975	
18.321	382.065	15	09	JAN 18,1975	
18.353	382.065	15	11	JAN 18,1975	
18.386	382.098	15	13	JAN 18,1975	
18.418	381.998	15	15	JAN 18,1975	
18.451	382.065	15	17	JAN 18,1975	
18.484	382.098	15	19	JAN 18,1975	
18.516	382.132	15	21	JAN 18,1975	
18.549	382.065	15	23	JAN 18,1975	
18.581	382.065	15	25	JAN 18,1975	
18.614	382.065	15	27	JAN 18,1975	
18.647	382.065	15	29	JAN 18,1975	
18.679	382.032	15	31	JAN 18,1975	
18.712	382.032	15	33	JAN 18,1975	
18.744	382.098	15	35	JAN 18,1975	
18.777	382.065	15	37	JAN 18,1975	
18.810	381.998	15	39	JAN 18,1975	
18.842	381.932	15	41	JAN 18,1975	
18.875	382.065	15	42	JAN 18,1975	
18.907	382.032	15	44	JAN 18,1975	
18.940	381.998	15	46	JAN 18,1975	
18.973	382.032	15	48	JAN 18,1975	
19.005	382.032	15	50	JAN 18,1975	
19.038	382.065	15	52	JAN 18,1975	
19.070	381.832	15	54	JAN 18,1975	
19.103	382.065	15	56	JAN 18,1975	
19.136	381.998	15	58	JAN 18,1975	
19.168	381.965	16	00	JAN 18,1975	
19.201	381.998	16	02	JAN 18,1975	
19.233	381.965	16	04	JAN 18,1975	
19.266	382.032	16	06	JAN 18,1975	
19.299	381.998	16	08	JAN 18,1975	
19.331	381.965	16	10	JAN 18,1975	
19.364	382.032	16	12	JAN 18,1975	
19.396	382.032	16	14	JAN 18,1975	
19.429	382.098	16	16	JAN 18,1975	
19.462	381.998	16	18	JAN 18,1975	
19.494	381.998	16	20	JAN 18,1975	
19.527	381.998	16	22	JAN 18,1975	

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19.559	382.032	16	24	JAN 18,1975	
19.592	381.998	16	26	JAN 18,1975	
19.625	381.932	16	27	JAN 18,1975	
19.657	381.965	16	29	JAN 18,1975	
19.690	381.965	16	31	JAN 18,1975	
19.722	381.965	16	33	JAN 18,1975	
19.755	381.998	16	35	JAN 18,1975	
19.788	381.965	16	37	JAN 18,1975	
19.820	381.998	16	39	JAN 18,1975	
19.853	381.965	16	41	JAN 18,1975	
19.885	381.965	16	43	JAN 18,1975	
19.918	381.932	16	45	JAN 18,1975	
19.951	381.998	16	47	JAN 18,1975	
19.983	381.965	16	49	JAN 18,1975	
20.016	381.965	16	51	JAN 18,1975	
20.048	381.998	16	53	JAN 18,1975	
20.081	381.898	16	55	JAN 18,1975	
20.114	381.965	16	57	JAN 18,1975	
20.146	381.932	16	59	JAN 18,1975	
20.179	381.998	17	01	JAN 18,1975	
20.211	382.032	17	03	JAN 18,1975	
20.244	381.698	17	05	JAN 18,1975	
20.277	381.932	17	07	JAN 18,1975	
20.309	382.032	17	09	JAN 18,1975	
20.342	382.032	17	11	JAN 18,1975	
20.374	381.965	17	12	JAN 18,1975	
20.407	381.932	17	14	JAN 18,1975	
20.440	381.898	17	16	JAN 18,1975	
20.472	381.932	17	18	JAN 18,1975	
20.505	381.932	17	20	JAN 18,1975	
20.537	381.965	17	22	JAN 18,1975	
20.570	381.965	17	24	JAN 18,1975	
20.603	381.932	17	26	JAN 18,1975	
20.635	381.932	17	28	JAN 18,1975	
20.668	381.898	17	30	JAN 18,1975	
20.700	381.932	17	32	JAN 18,1975	
20.733	381.965	17	34	JAN 18,1975	
20.766	381.932	17	36	JAN 18,1975	
20.798	381.932	17	38	JAN 18,1975	
20.831	381.932	17	40	JAN 18,1975	

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20.863	381.965	17	42	JAN 18,1975	
20.896	381.932	17	44	JAN 18,1975	
20.929	381.898	17	46	JAN 18,1975	
20.961	381.932	17	48	JAN 18,1975	
20.994	381.998	17	50	JAN 18,1975	
21.026	381.998	17	52	JAN 18,1975	
21.059	381.998	17	54	JAN 18,1975	
21.092	381.998	17	55	JAN 18,1975	
21.124	381.965	17	57	JAN 18,1975	
21.157	381.898	17	59	JAN 18,1975	
21.189	381.665	18	01	JAN 18,1975	
21.222	381.932	18	03	JAN 18,1975	
21.255	381.798	18	05	JAN 18,1975	
21.287	381.865	18	07	JAN 18,1975	
21.320	381.898	18	09	JAN 18,1975	
21.352	381.798	18	11	JAN 18,1975	
21.385	381.765	18	13	JAN 18,1975	
21.418	381.865	18	15	JAN 18,1975	
21.450	381.865	18	17	JAN 18,1975	
21.483	381.898	18	19	JAN 18,1975	
21.515	381.898	18	21	JAN 18,1975	
21.548	381.865	18	23	JAN 18,1975	
21.581	381.865	18	25	JAN 18,1975	
21.613	381.898	18	27	JAN 18,1975	
21.646	381.898	18	29	JAN 18,1975	
21.678	381.898	18	31	JAN 18,1975	
21.711	381.898	18	33	JAN 18,1975	
21.744	381.898	18	35	JAN 18,1975	
21.776	381.898	18	37	JAN 18,1975	
21.809	381.898	18	39	JAN 18,1975	
21.841	381.832	18	40	JAN 18,1975	
21.874	381.932	18	42	JAN 18,1975	
21.907	381.932	18	44	JAN 18,1975	
21.939	381.832	18	46	JAN 18,1975	
21.972	381.865	18	48	JAN 18,1975	
22.004	381.932	18	50	JAN 18,1975	
22.037	381.898	18	52	JAN 18,1975	
22.070	381.898	18	54	JAN 18,1975	
22.102	381.832	18	56	JAN 18,1975	
22.135	381.865	18	58	JAN 18,1975	

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22.167	381.898	19	00	JAN 18,1975	
22.200	381.898	19	02	JAN 18,1975	
22.233	381.865	19	04	JAN 18,1975	
22.265	381.932	19	06	JAN 18,1975	
22.298	381.898	19	08	JAN 18,1975	
22.330	381.865	19	10	JAN 18,1975	
22.363	381.832	19	12	JAN 18,1975	
22.396	381.898	19	14	JAN 18,1975	
22.428	381.932	19	16	JAN 18,1975	
22.461	381.898	19	18	JAN 18,1975	
22.493	381.898	19	20	JAN 18,1975	
22.526	381.898	19	22	JAN 18,1975	
22.559	381.865	19	24	JAN 18,1975	
22.591	381.832	19	25	JAN 18,1975	
22.624	381.865	19	27	JAN 18,1975	
22.656	381.898	19	29	JAN 18,1975	
22.689	381.865	19	31	JAN 18,1975	
22.722	381.865	19	33	JAN 18,1975	
22.754	381.865	19	35	JAN 18,1975	
22.787	381.865	19	37	JAN 18,1975	
22.819	381.865	19	39	JAN 18,1975	
22.852	381.765	19	41	JAN 18,1975	
22.884	381.765	19	43	JAN 18,1975	
22.917	381.865	19	45	JAN 18,1975	
22.950	381.932	19	47	JAN 18,1975	
22.982	381.865	19	49	JAN 18,1975	
23.015	381.865	19	51	JAN 18,1975	
23.047	381.865	19	53	JAN 18,1975	
23.080	381.832	19	55	JAN 18,1975	
23.113	381.898	19	57	JAN 18,1975	
23.145	381.765	19	59	JAN 18,1975	
23.178	381.832	20	01	JAN 18,1975	
23.210	381.865	20	03	JAN 18,1975	
23.243	381.665	20	05	JAN 18,1975	
23.276	381.798	20	07	JAN 18,1975	
23.308	381.832	20	08	JAN 18,1975	
23.341	381.865	20	10	JAN 18,1975	
23.373	381.798	20	12	JAN 18,1975	
23.406	381.765	20	14	JAN 18,1975	
23.439	381.865	20	16	JAN 18,1975	

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23.471	381.865	20	18	JAN 18,1975	
23.504	381.832	20	20	JAN 18,1975	
23.536	381.798	20	22	JAN 18,1975	
23.569	381.832	20	24	JAN 18,1975	
23.602	381.865	20	26	JAN 18,1975	
23.634	381.865	20	28	JAN 18,1975	
23.667	381.798	20	30	JAN 18,1975	
23.699	381.832	20	32	JAN 18,1975	
23.732	381.865	20	34	JAN 18,1975	
23.765	381.832	20	36	JAN 18,1975	
23.797	381.798	20	38	JAN 18,1975	
23.830	381.865	20	40	JAN 18,1975	
23.862	381.832	20	42	JAN 18,1975	
23.895	381.798	20	44	JAN 18,1975	
23.928	381.765	20	46	JAN 18,1975	
23.960	381.832	20	48	JAN 18,1975	
23.993	381.832	20	50	JAN 18,1975	
24.025	381.798	20	52	JAN 18,1975	
24.058	381.665	20	53	JAN 18,1975	
24.091	381.832	20	55	JAN 18,1975	
24.123	381.798	20	57	JAN 18,1975	
24.156	381.832	20	59	JAN 18,1975	STOP JETTING
24.188	381.598	21	01	JAN 18,1975	START RECOVERY
24.221	381.798	21	03	JAN 18,1975	
24.254	381.832	21	05	JAN 18,1975	
24.286	381.765	21	07	JAN 18,1975	
24.319	381.798	21	09	JAN 18,1975	
24.351	381.798	21	11	JAN 18,1975	
24.384	381.832	21	13	JAN 18,1975	
24.417	381.798	21	15	JAN 18,1975	
24.449	381.798	21	17	JAN 18,1975	
24.482	381.798	21	19	JAN 18,1975	
24.514	381.832	21	21	JAN 18,1975	
24.547	381.798	21	23	JAN 18,1975	
24.580	381.832	21	25	JAN 18,1975	
24.612	381.832	21	27	JAN 18,1975	
24.645	381.832	21	29	JAN 18,1975	
24.677	381.798	21	31	JAN 18,1975	
24.710	381.798	21	33	JAN 18,1975	
24.743	381.698	21	35	JAN 18,1975	

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24,775	381.665	21	37	JAN 18,1975	
24,808	381,798	21	38	JAN 18,1975	
24,840	381,765	21	40	JAN 18,1975	
24.873	381,832	21	42	JAN 18,1975	
24,906	381.865	21	44	JAN 18,1975	
24,938	381,832	21	46	JAN 18,1975	
24,971	381.832	21	48	JAN 18,1975	
25,003	381,798	21	50	JAN 18,1975	
25,036	381,832	21	52	JAN 18,1975	
25,069	381.832	21	54	JAN 18,1975	
25.101	381,832	21	56	JAN 18,1975	
25,134	381,865	21	58	JAN 18,1975	
25,166	381,698	22	00	JAN 18,1975	END TEST

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